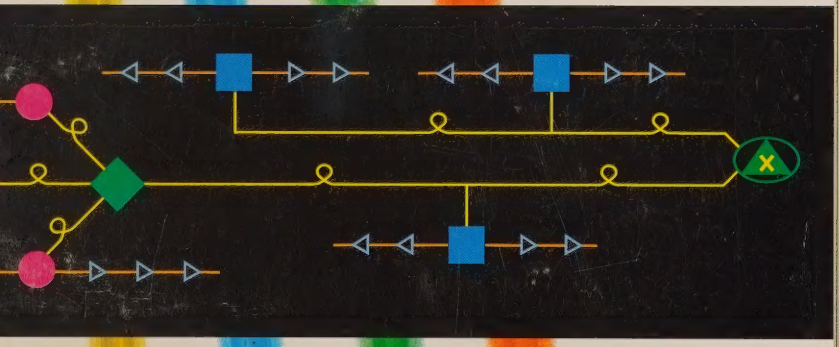
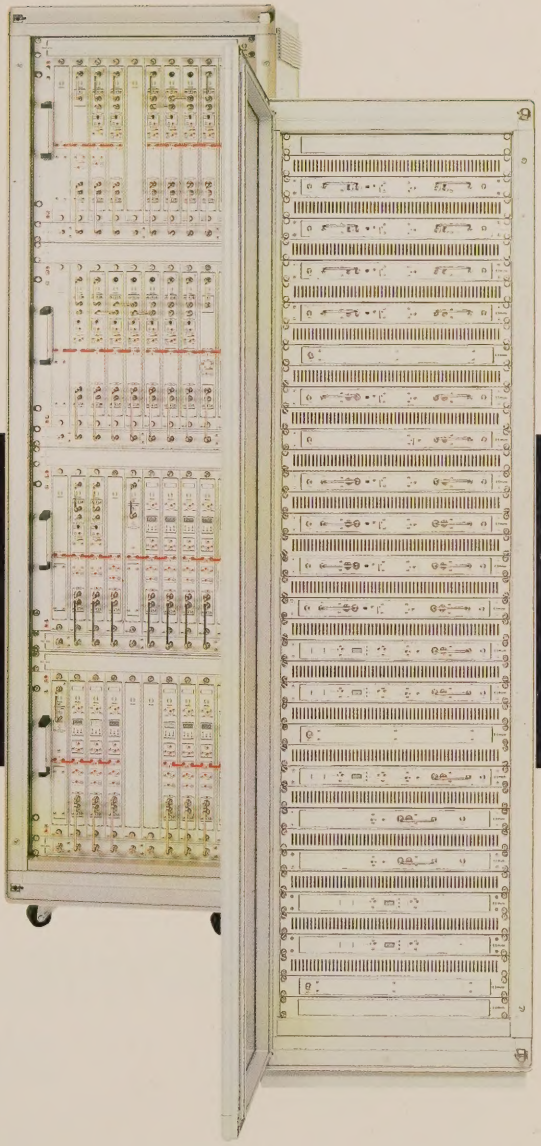
CATALOGUE

CATV





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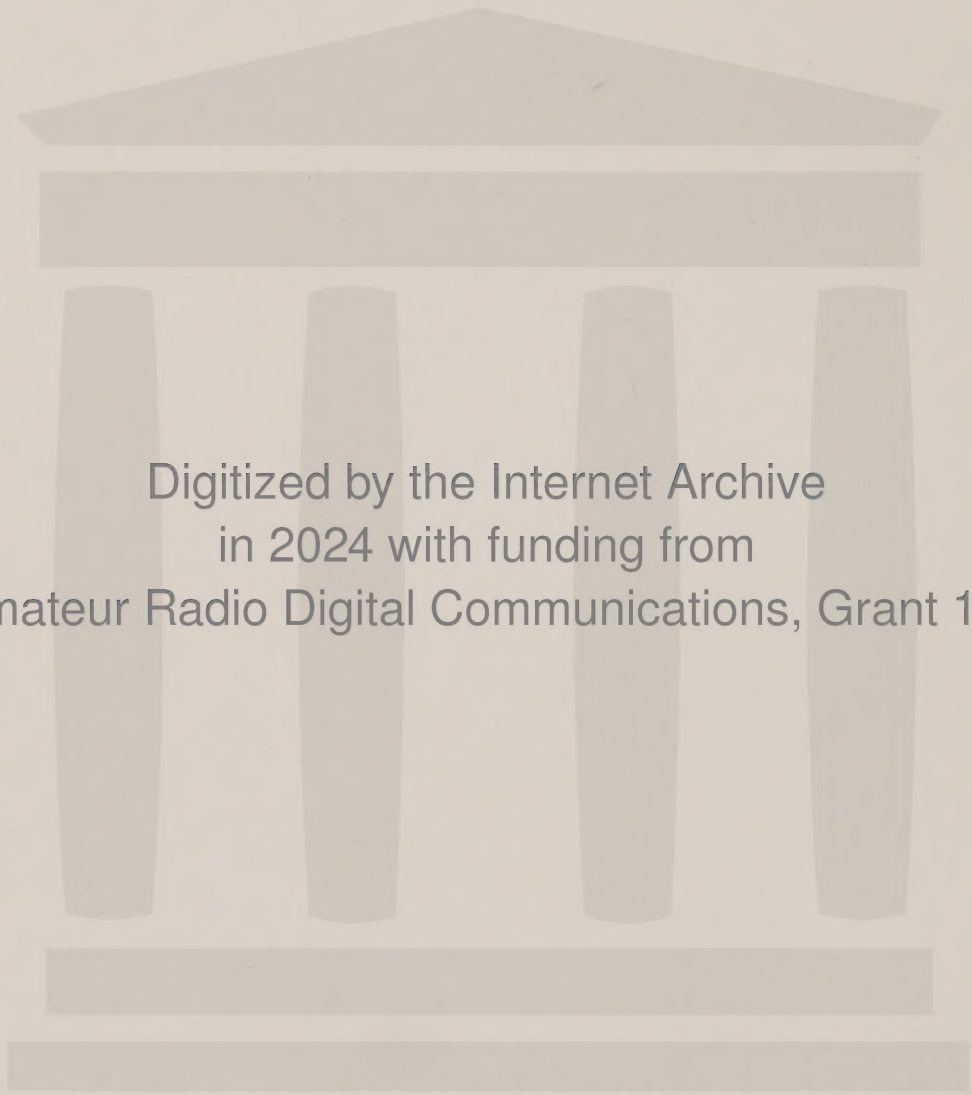

IKUSI

CATALOGUE

CATV

❷ HEADENDS

❸ AMPLIFIERS

❹ DISTRIBUTION AND SUBSCRIBER ELEMENTS

❺ CABLES & CONNECTORS

❼ POWER SUPPLIES

❾ MISCELLANEOUS

May 1997

IKUSI

CATV HEADENDS

IKUSI

- This is the section 2 of the IKUSI Professional Material catalogue. On the first pages 2A.1 to 2A.5, it offers you descriptions of the «TSP-5» and «TSP-19» series for CATV headends, that will help you to determine the most convenient to carry out your particular headend. Throughout pages 2A.6 to 2A.12 you will get in touch with the whole of the functional and auxiliary modules and will obtain the necessary information to fill your headend ordering form. Finally, on the pages 2B.1 to 2L.6 you will find the statement and characteristics of all components and options, including, in the functional units, their block diagrams. brief operation descriptions and complete data tables.

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TSP-5 AND TSP-19 SERIES HEADENDS

PROFESSIONAL HEADENDS

The present catalogue refers to essential cable broadcasting equipment. Radio and TV signals available in different ways (via satellite, terrestrial emission, recording, ...) are processed and afterwards distributed through a cable network or a high performance community installation.

Technical and constructive features of the series below described fit quality standards stablished by cable operators and PTT authorities throughout the world. Approval and homologation certificates have been obtained in several countries when required.

IKUSI's large experience in the field of headends technology, strongly influences the continuous improvement of the product. Specially valuable have been the contact and collaboration with other professionals of the sector for the identification of the optimum features and its permanent bringing up to date.

HEADEND SELECTION

Being the head end a basic element in any cable network, the strategy of offering the maximum flexibility to the user has been carried out. This fact allows the user to define the type of headend considered more appropriate for each project or installation.

Considering the relevant number of possible versions, and specially of their possible combinations, IKUSI decides to show a selection guide and let the designer choose his personal configuration.

As in every flexible philosophy, the procedure of configurating a product and, hence, the order, requires some attention. The variety of available options, together with intrinsic complexity of the system, largely justifies this uncomfortable consequence.

IKUSI's experts will help, with great pleasure, and clarify any question or doubt about this catalogue, and they will even propose a determined solution for a given question if desired.

WHICH SERIES TO CHOOSE?

There are two series for the same radioelectric functions. Almost every module is available with the same quality in both mounting types: TSP-5 and TSP-19 series.

TSP-5

This series is intended to optimize the global cost of the head end. It is highly specialized, thus it can make its mechanical compatibility with forcing modules less confortable.

The exploitation of common power feeding, the interconnection facility, the possibility of cascade multiplexing and the reduced room for vertical mounting, make the TSP-5 strongly competitive concerning price.

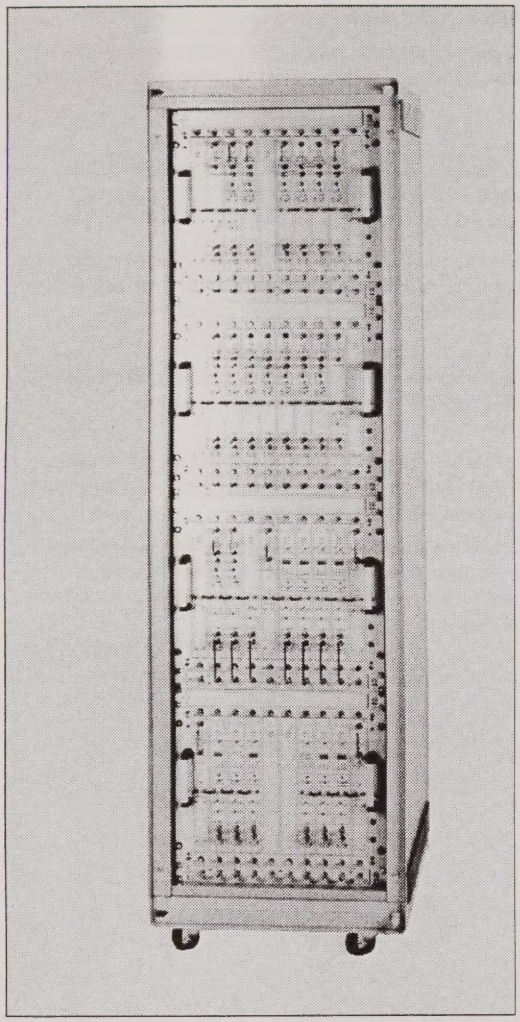
TSP-19

In this case, standarization becomes the main target. This makes series modules easily compatible with the ones brought from other manufacturers.

The authonomous built-in supply of each module and the 19"/1u rack format, make the TSP-19 similar, specially as mechanics are concerned, to the modules of outstanding brands in the world.

The high option flexibility as well as its horizontal 1u assembly with rear panel outlets, aid when increasing and updating already existing equipments, and in general, when building systems designed to be flexible and easy to be mounted.

VERTICAL SERIES - TSP-5



SERIES MAIN FEATURES

- Vertical mounting of the modules. Input/output connections access at the front pannel.
- Easy interconnection and wiring of modules, carried out by means of preformed metal coaxial bridges and rigid straps for DC power feeding.
- Shared usage of power supply units, able to feed several modules.
- Optional antenna signal splitting either by cascade (Z mode) or conventional splitters.
- Output signal coupling either by aperiodic multiplexers or cascade (Z mode).

TSP-5 SYSTEM DESCRIPTION

TSP-5 version functional modules are vertical units with a front panel of 40 x 355 mm provided with two knurled screws to fix them to an aluminium frame. The fastening to the 19" standard cabinet is not directly made, but by means of the above mentioned frame, able to allocate up to 10 of these modules. The mounting frame is also used to fix on it the arriving antenna signal cable connectors and the RF output ones.

Once the modules are fixed, preformed metallic, coaxial bridges can be used for RF interconnection, making the assembly look clear and simple, besides of allowing a fast and easy access to any point of the system. The same procedure is used in the case of connecting vertical modules to an horizontal output multiplexor, when conventional aperiodic signal adding option has been chosen.

Power supplies have the same vertical format above described, thus they can be mounted in the same way. Their quantity and position depend on the total feeded modules power consumption. DC connection is achieved by isolated rigid straps. The size of a modules frame is 19" (483 mm) wide per 8 units (355 mm) high. Multiplexers are only 1 unit high, due to their horizontal shape, and they should also be mounted in the bottom of the frames for signal coupling function.

A range of bridges, blank panels, fans and other common general accessories are useful to properly finish headend assembly.

MULTIPLEXING AND SPLITTING

There are two general ways. A hybrid solution is also feasable.

Procedure 1 - Cascade ("Z mode"):

Used at the output. It can also be used at input when signals origin is terrestrial broadcast.

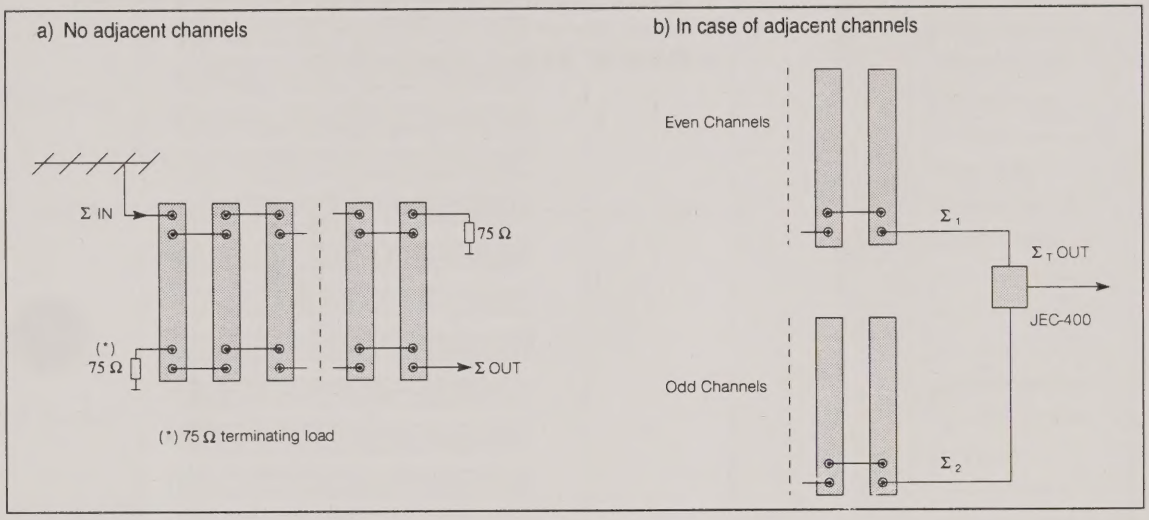


Fig. 1

Procedure 2 - Aperiodic multiplexing:

Used at input and output as well. The most interesting case is the last one. Procedures are as follow:

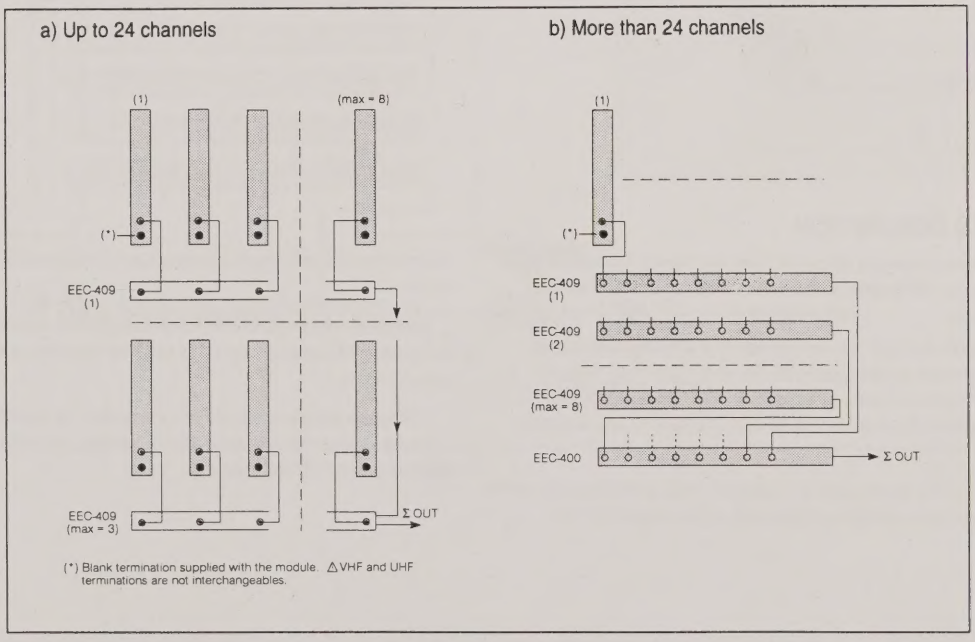
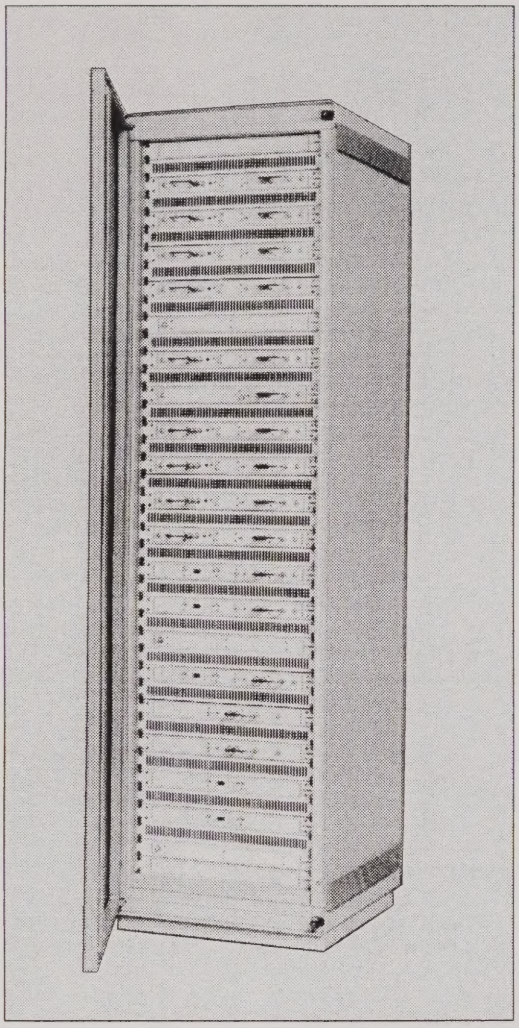


Fig. 2

INPUT APERIODIC SPLITTERS

Conventional splitters can be used for terrestrial and satellite signal splitting. Anyway, IKUSI offers a specific product for satellite TV reception, the DEC-410, which is performed as an active splitter (page 2H.1) fitted to mechanics and look of TSP-5 series.

HORIZONTAL 19"/1U SERIES - TSP-19



SERIES MAIN FEATURES

- Horizontal shape (19"/1u). All connections are at the rear panel.
- Universal module format, with authonomous built-in power supply.
- Signal addition and splitting by broadband multiplexers exclusively.
- IN/OUT RF test points at the front panel.

TSP-19 SYSTEM DESCRIPTION

This series is characterized by its 1u (44 mm) high format, that allows direct fastening of modules to 19" standard racks without the aid of inter-mediate mechanical interfaces.

RF connections are made at the rear pannel. This way, the equipments appearence is not affected by the cabling layout which can be as free and flexible as wished. The fact of using just aperiodic multiplexers for signal addition, and independent power feeding for each module, makes assembly simple and easy.

Main functions can be monitorized by means of check points available at the front pannel, which provide samples of input and output signals. For RF interconnection, only one multiplexer type is needed (EEC-400), as picture 3 shows.

The same as for the TSP-5, a broadband trunk amplifier could be necessary to increase RF output power so as to fit the networks working signal level requirements.

Other mechanical or electrical accessories, not specific for this series, but required to properly finish the station assembly, can be found among the ones used in general 19" rack systems.

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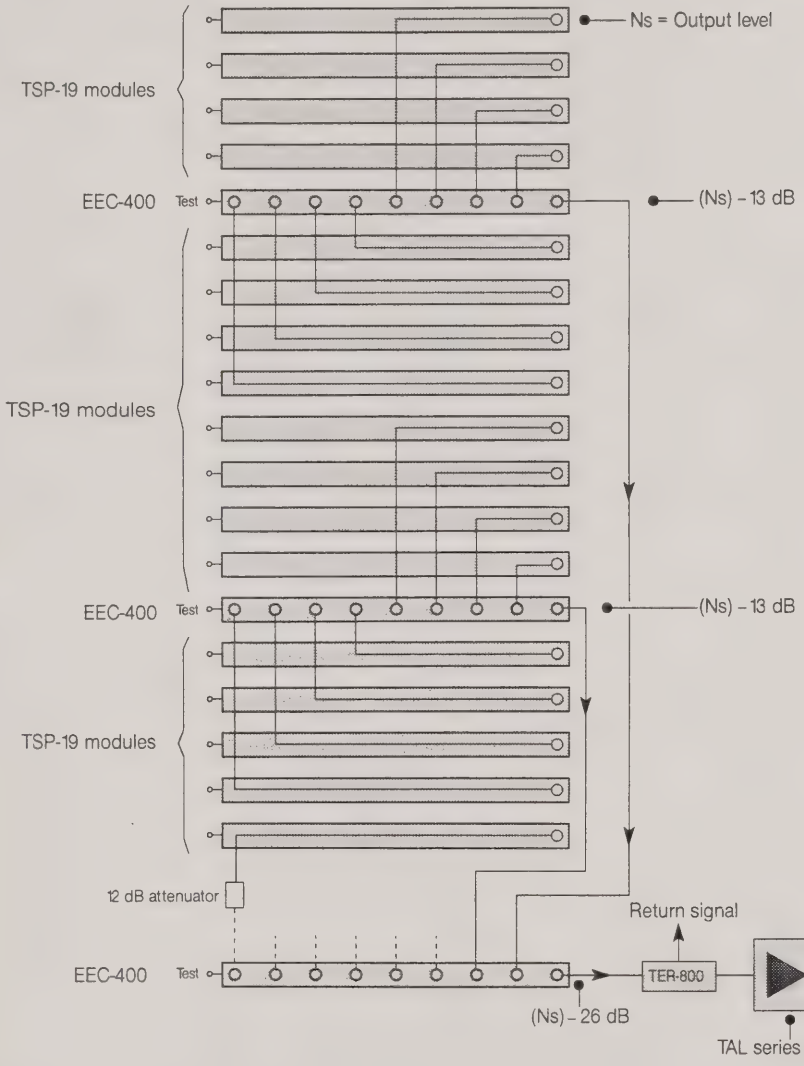
OUTPUT MULTIPLEXING

Output multiplexing system becomes extremely simple, as EEC-400 type module is just required. The output level available in each module allows to afford the intrinsic multiplexing losses without causing low signal noise degradation, at least up to 64 channels.



Number of channels	Number of multiplexers
2 - 8	1
9 - 15	2
16 - 22	3
23 - 29	4
30 - 36	5
37 - 43	6
44 - 50	7
51 - 57	8
58 - 64	9

Fig. 3

INPUT SPLITTING

Splitting and previous processing of TV signals coming from antennas, LNBs or any other source, can be carried out by standard F connector type products. As a wide range of such accessories already exists, specific material for this purpose has not been foreseen, with the exception of a supply module intended for LINBs (+18 Vdc) and preamplifiers (+24 Vdc), voltages of which are not currently available at headend stations.

TSP-5 AND TSP-19 SERIES HEADENDS

GENERAL HEADEND LAYOUT

A complete headend system, besides of the station itself, integrates other functions as shown in the diagram. Notice that the shaded areas refer to products collected in these brochures. For the rest of materials, one should find them in the general catalogue.

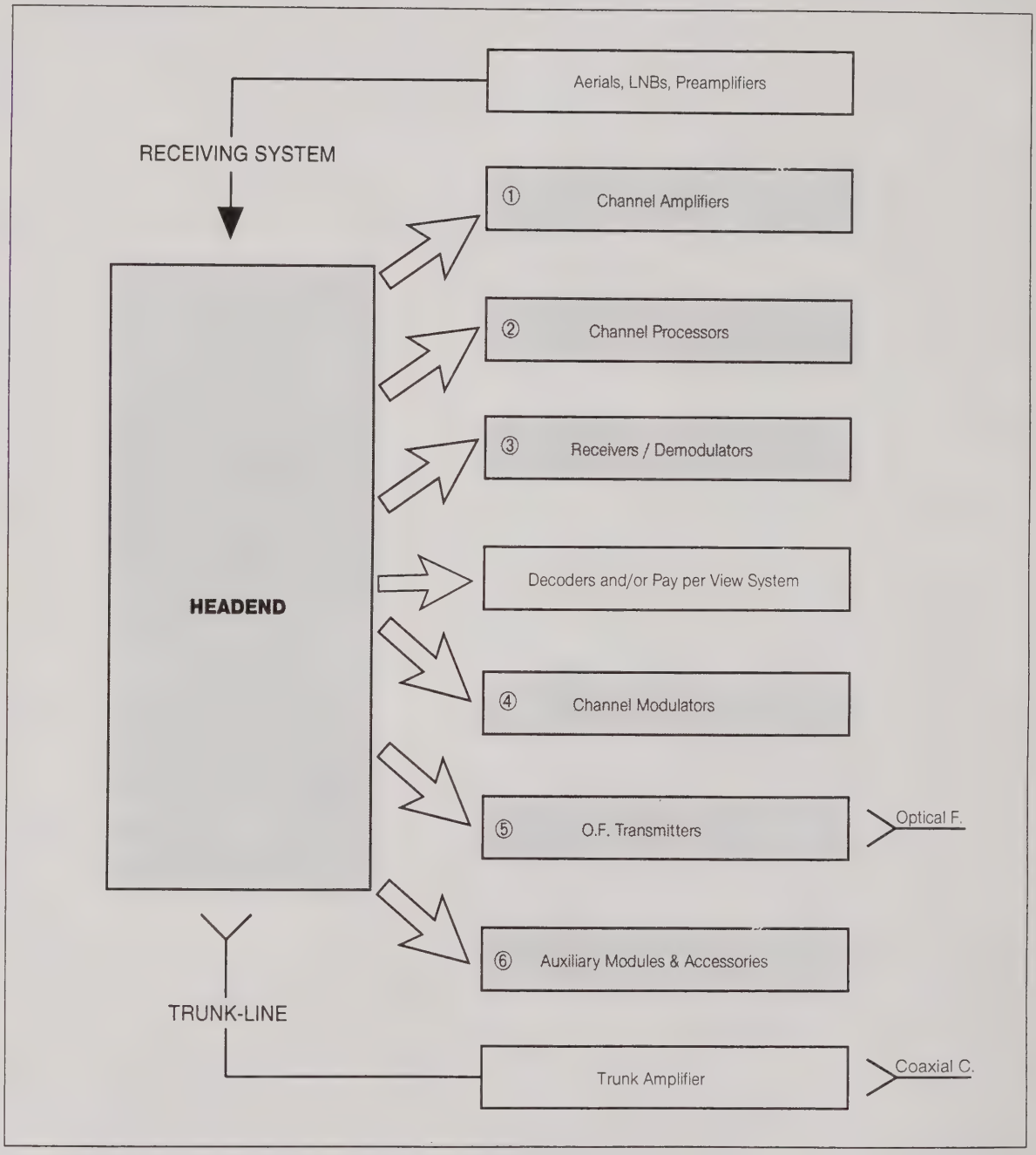


Fig. 4.

FUNCTIONAL MODULES DESCRIPTION

① **Direct channel amplifier**

Its aim is to amplify, filter and stabilize a TV channel of the allocated bands, without frequency modification. It is the simplest amplifier version.

② **Channel processor**

It converts an incoming channel to a similar or different output one. The double conversion system used and the pass through a low IF, provide high selectivity and sophisticated signal processing, which makes it ideal for adjacent channel operations.

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③ **Receiver / Demodulator**

It tunes and selects-out from a TV terrestrial or satellite channel, base-band or video and audio signals. At this point, video/audio processing is possible: scrambling, decoding, ... It usually complements (besides of with the above mentioned video processing equipments) with a modulator that turns RF signal into desired TV band and channel.

④ **Channel modulator**

It turns first, video and audio signals into an IF signal. After different processing options, this signal is converted into an available TV channel for terrestrial or cable. It allows absolutely safe adjacent channel operation.

⑤ **Optical fiber transmitter**

It works as a transducer or interface between the radioelectric (RF) and optical system when the headend is connected to an optical fiber network. It is also used as a receiver (reverse transducer) when return way option has been installed.

⑥ **Auxiliary modules and accessories**

This chapter contains some singular modules and those ones that perform common functions for the whole headend station. There are also included electrical and mechanical accessories for the both series. For general purpose accessories, see the appropriate catalogue.

CONFIGURATING FUNCTIONAL MODULES

The already described functional modules are built from one or several subsystems and their options. The selection guide is based on the following diagrams which are useful for:

1) Identifying the desired functional module components, with its possible options, avoiding the risk of omitting a vital or simply convenient subsystem.

2) Knowing the technical features of the selected subsystems consulting the proper pages in the catalogue indicated in each diagram.

To use selection diagrams, only to pay attention to component parts of each module is needed. These parts are sorted from top to bottom and linked by the + sign. All the elments of the shaded squares are usually required to complete a functional module, unless the word "nothing" appears, meaning that the lack of such function is itself the default option.

If any assembly option is ordered, modules arre delivered as spare parts in a properly identified individual package (OEM supply). Even though the "nothing" option for assembly mode is not specified at the diagram (for simplicity reasons), it is understood that such option is always possible.

Remarks emphasize key points despite of giving information, in some cases, redundant.

HEADENDS - CONFIGURATING MODULES

Module/Function	Built from the subsystems	Version	Page	Remarks
CHANNEL AMPLIFIER ①	Amplifier	Fixed channel	2B.1	Indicate channel and system
	+			
	Assembly Option	Vertical TSP-5 - single	2L.1	–
		Horizontal Rack 19" - single	2L.5	–
CHANNEL PROCESSOR ②	Down-Converter	Fixed channel	2C.2	Indicate channel and system
		Agile	2C.0	(Being developed)
	+			
	IF Filter	High selectivity	2C.4	Compulsory
	+			
	Up-Converter (with adjustment of the carriers' level ratio)	Fixed channel	2C.3	Indicate channel and system
		Agile	2C.0	(Being developed)
	+			
	LCD Display (agile version only)	Vertical display	2C.0	One for each agile converter compulsory
		Horizontal display	2C.0	
	Nothing	Without display		For fixed converters
	+			
	Assembly Option	Vertical TSP-5 - double	2L.1	–
		Horizontal TSP-19 - double	2L.5	–

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HEADENDS - CONFIGURATING MODULES

Module/Function	Built from the subsystems	Version	Page	Remarks
SATELLITE TV RECEIVER – DEMODULATOR ③ a	Satellite Receiver	Agile	2D.1	–
	+			
	LCD Display	Vertical display	2D.3	Compulsory
		Horizontal display	2D.3	
	+			
	Audio Expandor	Wegener Panda™ / others	2D.3	–
	Nothing	Without expandor	–	Default option
	+			
	LNBs +18V Feeding Option	Only in TSP-19 horizontal assembly	2L.6	–
	Nothing	+12V voltage inserted at IF input	–	Default option
	+			
	Assembly Option	Vertical TSP-5 - single	2L.1	–
		Horizontal TSP-19 - single	2L.5	–
TERRESTRIAL TV RECEIVER – DEMODULATOR ③ b	Down-Converter	Fixed channel	2C.0	Indicate channel and system
		Agile	2C.0	(Being developed)
	+			
	LCD Display (agile version only)	Vertical display	2C.0	Compulsory for agile converter
		Horizontal diaplay	2C.0	
	Nothing	Without diaplay	- -	For filtered converter
	+			
	Demodulator	Multistandard	2E.0	(Being developed)
	+			
	Assembly Option	Vertical TSP-5 - double	2L.1	–
		Horizontal TSP-19 - double	2L.5	–

HEADENDS - CONFIGURATING MODULES

Module/Function	Built from the subsystems	Version	Page	Remarks
CHANNEL MODULATOR ④	Modulator	Fixed channel	2F.1	Indicate channel and TV system
		Agile	2F.5	Indicate TV system
	+			
	IF Filter	High selectivity	2F.4 2F.8	Compulsory
	+			
	LCD Display (agile version only)	Vertical display	2F.8	Compulsory for agile modulator
		Horizontal display	2F.8	
	Nothing	Without indicator	–	For fixed modulator
	+			
	Digital Control Option (agile version only)	Bus RS-485	2F.7	(Being developed)
	Nothing	–	–	Default option
	+			
	Assembly Option	Vertical TSP-5 - single	2L.1	–
		Vertical TSP-5 - double (fixed modulator only)	2L.1	–
		Horizontal TSP-19 - single	2L.5	–
		Horizontal TSP-19 - double	2L.5	–
SAT RECEIVER + MODULATOR	It is built adding a modulator ④ to a satellite receiver-demodulator ③. Each of them with its own subsystems; and one (unique) double assembly option.			
O.F. TRANSMITTER (A.M.) ⑤	Power and Control Module	Rack 19"	6B.0	–
	+			
	Return Way Option	Return way	6B.0	–
	Nothing	Without return way	–	–
	+			
	Laser	Optical power selection	6B.0	–

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HEADENDS - CONFIGURATING MODULES

Module/Function	Built from the subsystems	Version	Page	Remarks
PILOT CARRIER GENERATOR ⑥a	Pilot Carrier Generator	Two carriers	2G.3	Indicate frequencies
	+			
	Assembly Option	Horizontal TSP-19 - single	2L.5	–
FM AMPLIFIER ⑥b	FM Band Amplifier	Max level carrier AGC	2G.1	–
	+			
	Assembly Option	Vertical TSP-5 - single	2L.1	–
		Horizontal TSP-19 - single	2L.5	–
SATELLITE TV SPLITTER ⑥c	Satellite Splitter	Active	2H.1	–
	+			
	Power Supply Unit	For LNBs and modules	2H.2	Indicate mains voltage
	+			
	Assembly Option	Vertical TSP-5 - double	2L.1	–
POWER SUPPLY UNIT ⑥d	Power Supply Unit	For functional modules	2H.2	Indicate mains voltage
	+			
	Assembly Option	Vertical TSP-5 - single	2L.1	–
RF MISCELLANEOUS ⑥e	Multiplexers	Rack 19"/1u	2I.1	–
	RF/DC Diplexer / Attenuator	Plugable	2I.3	–
	FM Rejection Filter	Plugable	2I.3	–
	Reverse Way Diplexer	–	2I.3	–
	Compact Modulator for Reverse Way	–	2I.3	Indicate channel and system
MECHANICS ⑥f	19" Cabinets	Several heights	2K.1	–
	Assembly Accessories	–	2K.3	–

HEADENDS - ORDERING EXAMPLE

ORDER EXAMPLE

Depending on the order nature –factory mounted headend, spare parts, and so on ...–, the order form can vary to better fit specific cases. As an idea, a possible way of ordering which allows a fast check of modules bill is proposed in the following example.

Item	Ref.	Model	Description	Qty.	Remarks
1	3732	AEC-440	Single channel amplif.	4	C21, C24, C27, C29 - (B/G)
	3600	OMS-119	Single assembly opt.	4	
2	3720	CEC-440	Down converter	1	C25 - (B/G)
	2624	SAW-202	IF filter	1	
	3726	CEC-404	Up converter	1	C41 - (B/G)
	3602	OMD-219	Double assembly opt.	1	
3	3720	CEC-440	Down conv.	1	C35 - (B/G)
	2624	SAW-202	IF filter	1	
	3726	CEC-404	Up converter	1	C43 - (B/G)
	3602	OMD-219	Double assembly opt.	1	
4	3712	SUI-400	Sat. receiver	2	
	3610	IAH-119	Horizontal display	2	
	3602	OMD-219	Double assembly opt.	2	
	3708	MEC-440	Modulator	2	C44, C45 - (B/G)
	2622	SAW-200	IF filter	2	
5	3712	SUI-400	Sat. receiver	1	
	3610	IAH-119	Horizontal display	1	
	3602	OMD-219	Double assembly opt.	1	
	3708	MEC-440	Modulator	1	C46 - (B/G)
	2622	SAW-200	IF filter	1	
	3612	OLN-018	LNB supply	1	
6	3708	MEC-440	Modulator	5	C61, C62, C63, C64, C65 - (B/G)
	2622	SAW-200	IF filter	5	
	3600	OMS-119	Single assembly opt.	5	
7	3708	MEC-440	Modulator	2	C66, C66 - (B/G)
	2622	SAW-200	IF filter	2	
	3602	OMD-219	Double assembly opt.	1	
8	3616	COR-220	Patch-cord	16	
9	2592	EEC-400	Multiplexer	3	

❶ ❷ ❸ ❹ ❺ ❻

❶→ Convenient to identify and control.

❷→ **Compulsory** in every order.

❸→ Convenient to check references.

❹→ Convenient to check bill of parts.

❺→ **Compulsory** in every order.

❻→ **Compulsory** if determined by the selection table.

The rest of information, specific for each customer (prices, discounts, ...), that is usually included in the orders, is not referred in this example, as it is not necessary for this explanation purposes.

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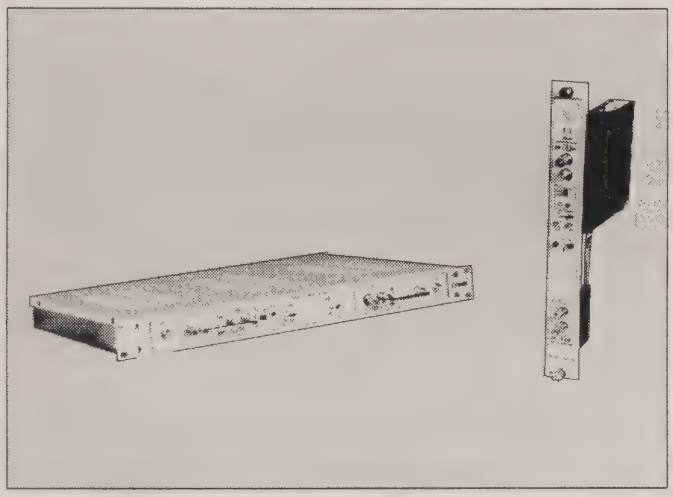
TSP - TV SINGLE-CHANNEL AMPLIFIERS



- All systems and TV channels between 10 and 862 MHz.
- Delayed AGC with desabling switch.
- Squelch and absolute power limiter.
- Input level status display (high - OK - low).
- Adjustable RF output level.

FUNCTIONAL DESCRIPTION

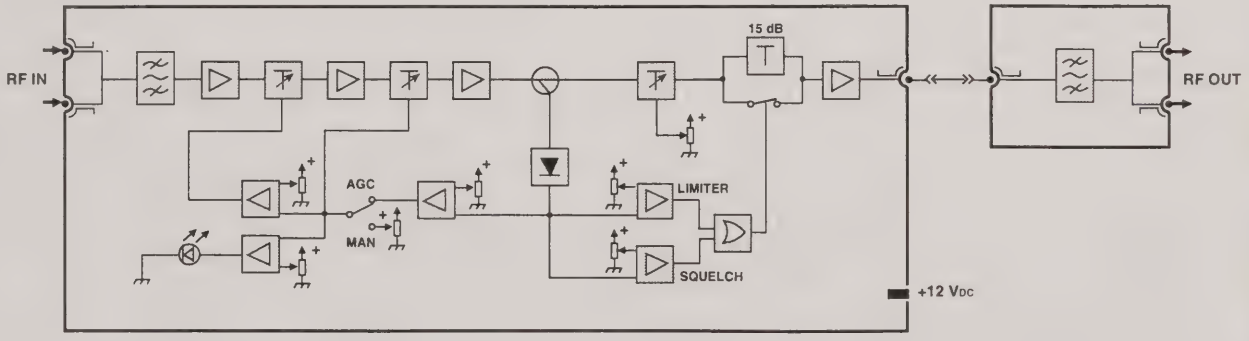
The equipment performs a direct amplification of a TV channel. Passive, tuned filters at the input and output ports provide excellent RF selectivity, so avoiding intermodulation phenomena from strong adjacent channels and assuring a spurious-free amplified signal.

An AGC circuit featuring true peak response is delayed at the input stage, so improving S/N ratio as far as in-channel signal increases; this fact should not be possible if a conventional front-end attenuator was used instead.

Two protective circuits in the output stage reduce potentially interfering signals: a squelch circuit keeps low noise power when wanted carrier disappears –that can affect S/N ratio in adjacent channels–, and a power limiter, independent of incoming signal or amplifier gain, protects the systems against an excessive output level which can disturb the whole installation.

A colour changing LED on the front panel displays input level status to check if AGC pull-in range is overridden. An externally accesible switch desables AGC; this is particularly useful for headend adjustment, otherwise some measure values could be masked by the self leveling.

BLOCK DIAGRAM



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TSP - TV SINGLE-CHANNEL AMPLIFIERS

TECHNICAL DATA (1)

Model			AEC-410	AEC-430	AEC-440
Ref.			3728	3730	3732
TV channels allocated between:		MHz	40 - 100	100 - 300	300 - 862
Termination cap for single input/output (!)			Open c. (green)		Short c. (red)
Input and output impedance		Ω	75		
Input and output return loss		dB	≥ 15		
Input level	Minimum (squelch starting)	dBµV	45		
	AGC range		55 ... 80		
	Minimum for S/N ≥ 60 dB		70		
Noise figure		dB	≤ 6		
Output level	Nominal	dBµV	108		
	IMD= -54 dB (DIN 45004 K)		123		
Output level adjustment		dB	-20		
Output level stability		dB	± 0.75		
Selectivity	±10,5 MHz / ±17,5 MHz (channel centre)	dB	> 25 / > 45		–
	±12 MHz / ±20 MHz (channel centre)		–		>28 / >40
Group delay		ns	< ± 20		
Spurious in channel and band		dB	< -70		
Manual gain adjustment (desabled AGC)		dB	-25		
Supply voltage		VDC	+12		
Consumption		mA	310		
Operating temperature		°C	-10 ... +55		
RF connector type			"F"		
Outside dimensions (h x w x d)		mm	126 x 35 x 225 (main module)		70 x 32 x 87 (output filter)
Supplied accessories			Output filter interconnection coaxial bridge		
Assembly options feasability			Single only		
Packed weigth		kg	1.1		

(1) Values refer to single input/output configuration. In this case, discarded outlets must be fitted with special termination cap. See (!).
When both outlets are used ("Z" mode), a level reduction (about 3.5 dB) due to power splitting should be taken into account to calculate global values. Then cascade termination must be conventional 75 Ω load.

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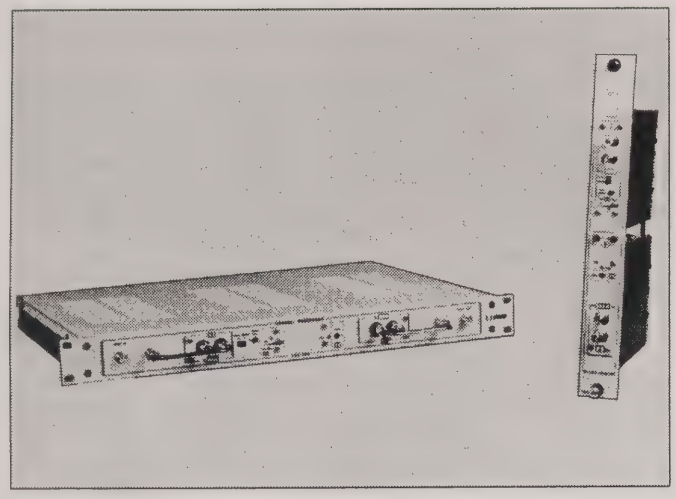
TSP - TV CHANNEL PROCESSORS



- All systems and TV channels between 12 and 862 MHz.
- Heterodyne double conversion. IF SAW filter. High degree of adjacent channel rejection.
- IF loop-through capability.
- Adjustment of the video/audio carrier ratio. Compatibility with stereo and dual sound.
- Delayed AGC with desabling switch.
- Mixer frequencies generation by synthesis through PLL and VCO.
- Squelch and absolute output level limiter.
- Input level status display (high - OK - low).
- Adjustable RF output level.

FUNCTIONAL DESCRIPTION

The IKUSI *TV Channel Processor* is used to put off-air broadcast channels or CATV channels onto the frequency layout of a cable network. It is made up of two modules, Down-Converter and Up-Converter, coupled through an external loop which allows interfacing with IF scrambling systems. A selective, gain adjustable IF-audio amplification stage in the up-converter permits 12 to 22 dB adjustment of the output channel video/audio carrier ratio –without affecting transmission of stereo or dual sound–, from any ratio between 8 and 18 dB of the input channel's. Later variations of this last ratio, in relation to the initial one and up to values into the 3-23 dB range, are compensated by an automatic control which keeps stable (±1 dB) the set output ratio; a colour changing LED warns when this ratio is out of setting by abnormal variations of the ratio at the input.

The heterodyne double conversion SAW filtered is designed for proper selectivity and very low group delay. It enables the equipment be used in adjacent channel systems.

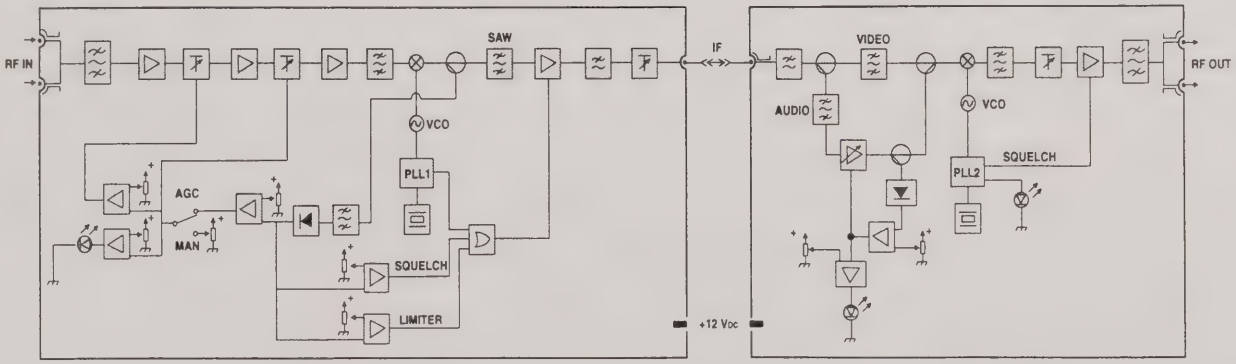
The AGC circuit features a true peak response through an only-video IF detection. The delayed control at the input stage improves S/N ratio as far as in-channel signal increases.

Two squelch circuits, one in each module, operating on the RF output signal, keep low noise power when wanted carrier disappears, and cancel out the output signal when up-converter PLL circuit is unlocking. An absolute power limiter, independent of incoming signal or gain level, protects the system against an excessive output level which can disturb the whole installation.

An externally accessible switch desables AGC; this is particularly useful for headend adjustment, otherwise some measure values could be masked by the self leveling. In normal operation, colour changing LED displays input level status to check if AGC pull-in range is overridden.

The use of passive, high selectivity single channel filters at input and output ports protects against intermodulation phenomena from strong adjacent channels and assures a spurious-free RF output.

BLOCK DIAGRAM



Down-Converter module

Up-Converter module

TSP - TV CHANNEL DOWN-CONVERTERS

TECHNICAL DATA (1)

				CEC-490	CEC-410	CEC-430	CEC-440
Model							
Ref.				3714	3716	3718	3720
Input TV channels allocated between:			MHz	12 - 55 (2)	40 - 100	100 - 300	300 - 862
Output video IF - (TV systems)			MHz	38.9 (B-G-I-L)	38 (D-K)	45.75 (M-N)	
RF input	Termination cap for single input (!)			Open (green)			Short c. (red)
	RF input impedance		Ω	75			
	RF input return loss		dB	>15			
	Input level	Minimum (squelch starting)	dBµV	70	35		
		AGC range		80 ... 100	45 ... 80		
		Minimum for S/N ≥ 60 dB		82	70		
	Manual gain adjustment (desabled AGC)		dB	-35	-35		
	Noise figure		dB	18	6		
	Carrier level ratio		dB	8 ... 18			
	Selectivity	$f \geq f_A + 1{,}5$ MHz $f \leq f_V - 1{,}5$ MHz	dB	>60			
		$f \geq f_A + 8{,}5$ MHz $f \leq f_V - 8{,}5$ MHz		>85			
	Image rejection		dB	>70			
	LO signal level at input		dBµV	<10			
IF output	IF output impedance		Ω	75			
	IF output return loss		dB	>15			
	IF output level		dBµV	86 (±1)			
	IF output level stability		dB	±0.75			
	IF carrier's frequency tolerance		kHz	±5			
	Group delay		ns	< ±20			
	Spurious in channel and band		dB	< -70			
General	Supply voltage		Vdc	+12			
	Consumption		mA	500			
	Operating temperature		°C	-10 ... +55			
	RF, IF connector type			" F "			
	Outside dimensions (h x w x d)		mm	126 x 35 x 225			
	Packed weight		kg	0.920			

(1) Values refer to single input configuration. In this case, discarded outlet must be fitted with special termination cap. See (!).
When both outlets are used ("Z" mode), a level reduction (about 3.5 dB) due to power splitting should be taken into account to calculate global values. Then cascade termination must be conventional 75 Ω load.

(2) Reverse way in CATV systems.
Channels recommended (video carrier): VR2 (24.25 MHz); VR3 (41.25 MHz); VR4 (48.25 MHz).

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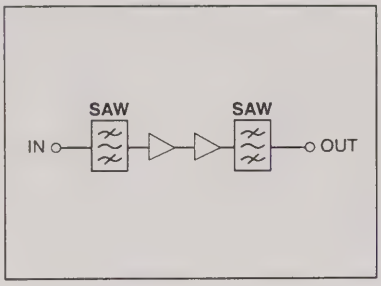
TSP - TV CHANNEL UP-CONVERTERS

TECHNICAL DATA (1)

Model				CEC-411	CEC-413	CEC-414
Ref.				3744	3746	3748
Output TV channels allocated between:			MHz	40 - 100	100 - 300	300 - 862
Input video IF - (TV systems)			MHz	38.9 (B-G-I-L)	38 (D-K)	45.75 (M-N)
RF output	Termination cap for single output (!)			Open (green)		Short c. (red)
	RF output impedance		Ω	75		
	RF output return loss		dB	≥15		
	Output level	Nominal (Vin FI=86 dBµV)	dBµV	108		
		IMD= -54 dB (DIN 45004 K)		123		
	Output level adjustment		dB	-20		
	Output level stability (2)		dB	±0.75		
	Carrier level ratio (external adjustment)		dB	12 ... 22		
	Stability of carrier level ratio (3)		dB	±1		
	Carriers' frequency tolerance (2)		kHz	±10		
	Group delay (2)		ns	< ±40		
	Spurious in channel and band (2)		dB	< -70		
IF input	IF input impedance		Ω	75		
	IF input return loss		dB	≥15		
	Nominal IF input level		dBµV	86		
General	Supply voltage		Vdc	+12		
	Consumption		mA	360		
	Operating temperature		°C	-10 ... +55		
	RF, IF connector type			"F"		
	Outside dimensions (h x w x d)		mm	126 x 35 x 225		
	Supplied accessories			Down-converter module interconnection coaxial bridge		
	Assembly options feasability (2)			Double only		
	Packed weight		kg	0.860		

(1) Values refer to single output configuration. In this case, discarded outlet must be fitted with special termination cap. See (!).
When both outlets are used ("Z" mode), a level reduction (about 3.5 dB) due to power splitting should be taken into account to calculate global values. Then cascade termination must be conventional 75 Ω load.
(2) Data related to the conjunction with the Down-Converter module.
(3) Input carriers' ratio between 3 and 23 dB.

TSP - TV CHANNEL PROCESSORS



IF FILTERS	(See below)
Indispensable for the operation of the Down-Converters: 1 Converter→1 Filter. Internal mounting. Factory assembly according to the order.	

Model	SAW-202	SAW-201	SAW-202	SAW-203	SAW-201
Ref.	**2624**	**2623**	**2624**	**2625**	**2623**
TV system	B / G	D / K	I	M / N	L

The appropriate filter will be selected in terms of the input channel TV system. So, for example, the required model for a built-in IF high selectivity filter, system B converter will be SAW-202 (Ref. 2624).

TECHNICAL DATA OF TV CHANNEL PROCESSOR

The *TV Channel Processor* –"Down-Converter + Up-Converter" ensemble– offers optimum response for any combination of input/output TV channels. Their characteristics are expounded in the Technical Data of both units: those related to the **RF input** in the Down-Converter and to the **RF output** in the Up-Converter, are entirely transferable as such; those in **General** section must be appropriately considered. Data involving IF input/output signal are not outstanding.

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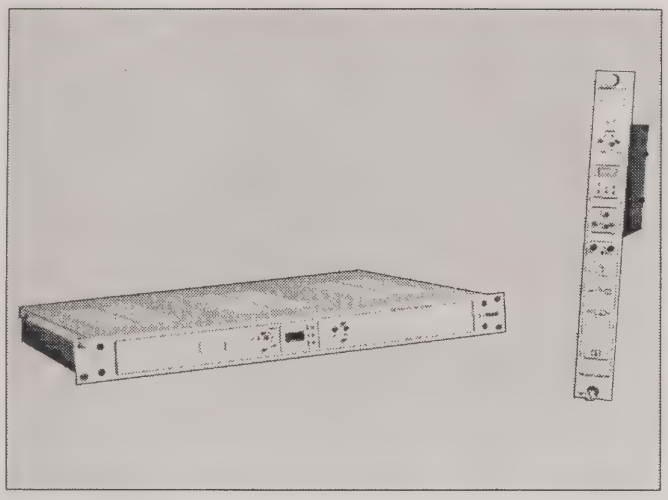
TSP - SATELLITE TV RECEIVER-DEMODULATOR



- C and Ku-band compatible.
- Microprocessor controlled.
- Selection and adjustment pushbutton controls. LCD display.
- Selectable IF bandwidth.
- De-emphasis CCIR 405-1, D2-MAC, flat.
- Selectable clamped, filtered, video output.
- Selectable audio- bandwidth and de-emphasis. Mono and stereo outputs. Optional expandor.

FUNCTIONAL DESCRIPTION

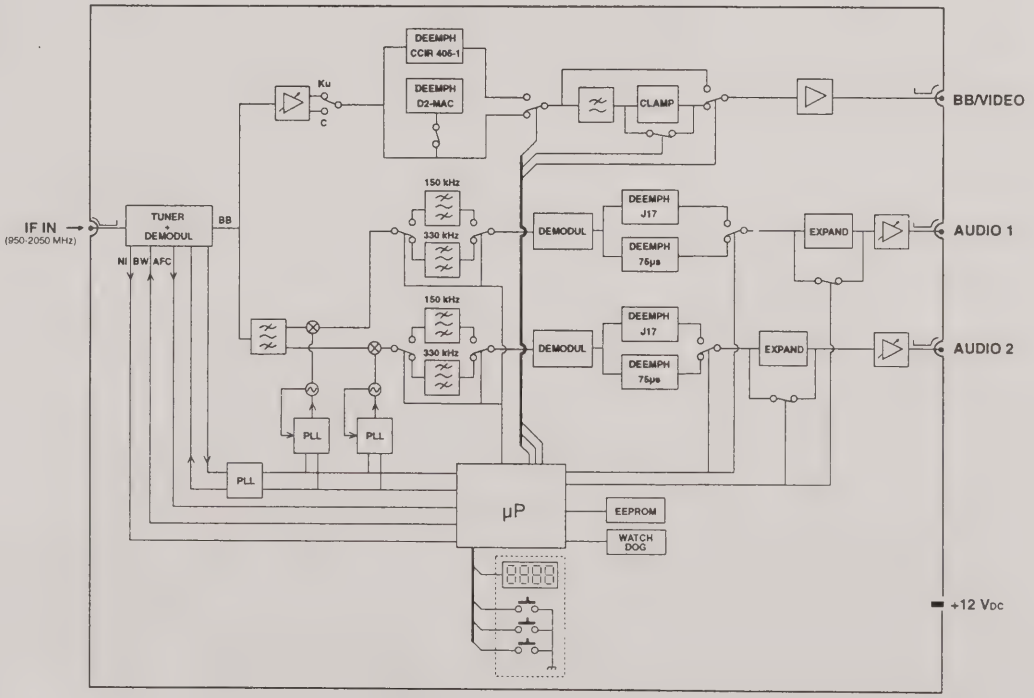
The SUI-400 receiver accepts satellite IF input signals at 950-2050 MHz from a C or Ku band source.

It uses microprocessor controlled circuitry to select –synthesized self-centering tuning– and set any satellite channel via three pushbuttons on the front panel. A comprehensive liquid crystal display, whose position on the panel is an option to be reflected in the order –horizontal or vertical mounting–, allows the operator to quickly verify all satellite feed settings. Current receiver status is continually displayed for visual checks.

The receiver uses a PLL demodulator which features excellent 6 dB C/N static threshold. The demodulated video and audio signals are processed separately to produce filtered or unfiltered video and stereo or mono audio –synthesized sub- carriers tuning–. These signals are available for use with the IKUSI MEC-400 series TV modulators, either directly or via a scrambling or unscrambling compatible equipment.

On request, the receiver may be equipped with one or two expandor circuits to receive satellite channels with audio noise reduction systems.

BLOCK DIAGRAM



IKUSI

TSP - SATELLITE TV RECEIVER-DEMODULATOR

TECHNICAL DATA

Model			SUI-400
Ref.			3712
RF input section	Input frequency	MHz	950 - 2050
	Input impedance	Ω	75
	Return loss	dB	≥ 10
	Input level	dBm	- 60 ... - 30
	IF (480 MHz) bandwidth	MHz	27 / 18 (1)
	AFC pull-in range	MHz	± 3
	Noise figure	dB	12
	Tuning steps	MHz	0.5
Video/base-band demodulating section	C/N static threshold level (in 27 MHz)	dB	6
	Video band	MHz	0.00002 ... 5
	Base-band width	MHz	10
	Frequency response	dB	± 0.25
	Video de-emphasis		CCIR 405-1 / D2-MAC (1)
	Video clamping efficiency	dB	> 40 / 0 (1)
	Differential gain	%	< 3
	Differential phase	°	< 3
	Cr/L delay	ns	< ± 20
	Demodulated video signal (75 Ω) – Adjustable	V_{pp}	1 (2)
	Base-band signal (75 Ω)	V_{pp}	1
	K-factor (2T pulse)	%	< 1.5
	Weighted S/N ratio (input: C/N = 14 dB; ΔB = 27 MHz)	dB	50
Audio demodulating section	Subcarrier's band	MHz	5.5 ... 9
	Bandwidth	kHz	150 / 330 (1)
	-2 dB frequency response	kHz	0.05 ... 15
	De-emphasis		75µs / J17 (1)
	Distortion (fm = 1 kHz; ΔF = 50 kHz)	%	< 1
	Demodulated audio signal (Z < 40 Ω) – Adjustable	dBm	0
General	Supply voltage	VDC	+12 (3)
	Consumption	mA	550
	Operating temperature	°C	-10 ... +55
	RF input connector type		"F"
	BB/video output connector type		"F"
	Audio outputs connector type		"RCA"
	Outside dimensions (h x w x d)	mm	126 x 35 x 202
	Assembly option feasability		Single
	Packed weight	kg	0.890

(1) Selectable from front panel pushbutton controls.
(2) Positive polarity (Ku band). Internal selection of negative polarity (C band).
(3) By-pass to IF input for LNB remote powering.

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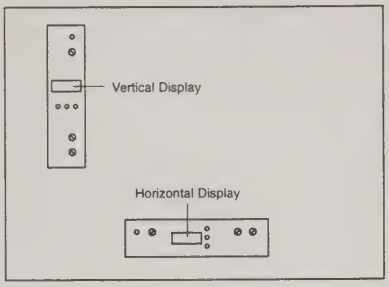
TSP - SATELLITE TV RECEIVER-DEMODULATOR



DISPLAY & ASSEMBLY	(See below)
Related to the Mounting Options of SUI-400 receiver. Two choices for two mounting options: Vertical Display (module in TSP-5 version) or Horizontal Display (module in TSP-19 version). Compulsory to be reflected in the order.	

Model	IAV-105	IAH-119
Ref.	3608	3610
Description	Vertical Display (module in TSP-5 version)	Horizontal Display (module in TSP-19 version)

AUDIO EXPANDOR	(See below)
To receive satellite channels with audio noise reduction systems. Internal mounting PCB card (1 or 2 units - mono or stereo sound) in SUI-400 receiver. Factory assembly according to the order.	

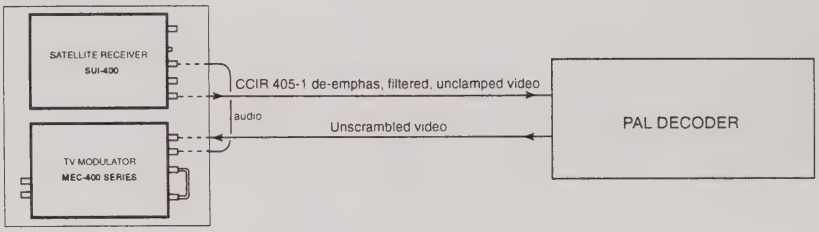
Model	SEA-300
Ref.	2627
Description	Panda™ compatible Expandor
Current consumption (at +12 V)	14 mA

TSP - SATELLITE TV RECEIVER-DEMODULATOR

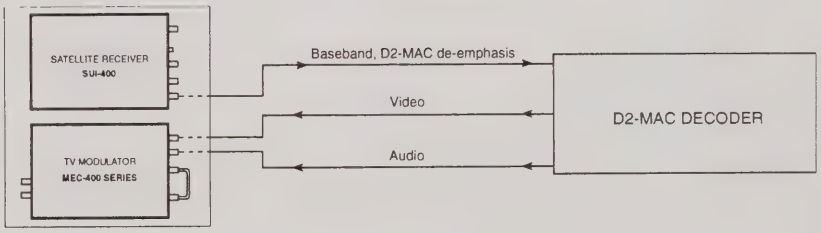
<<SATELLITE RECEIVER + TV MODULATOR>> DOUBLE MOUNTING

USING ENCODER AND DECODER EQUIPMENTS. Installation examples.

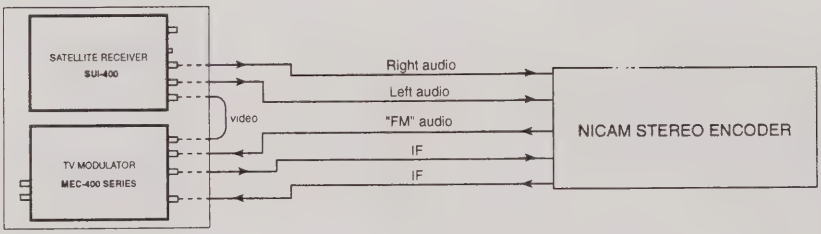
1. PAL video unscrambler.



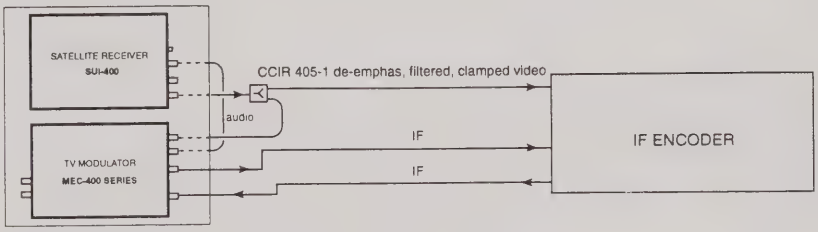
2. D2-MAC decoder.



3. NICAM stereo encoder.



4. Pay-per-view encoder.



NOTE: The characteristics of the video signal from SUI-400 satellite receiver –de-emphasis, filtering, clamping– are selected through the front panel pushbutton controls.

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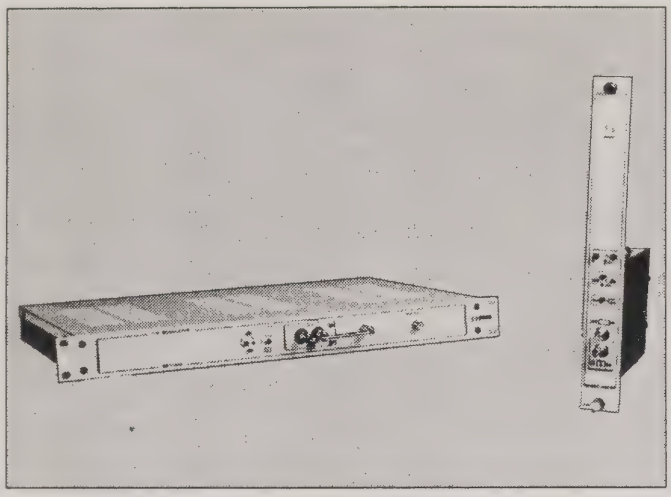
TSP - TV MODULATORS



- Base-band video and audio inputs.
- All systems and TV channels between 12 and 862 MHz.
- Heterodyne conversion. IF SAW filter. High vestigial sideband selectivity.
- IF loop-through capability.
- Adjustable audio modulation index.
- Output TV channel frequency through VCO-PLL synthesis. Squelch circuit activated when PLL unlocking.
- Adjustable RF output level.

FUNCTIONAL DESCRIPTION

The modulator accepts signals of 0.7-1.4 Vpp from video sources such as a satellite receiver, TV camera, video tape recorder or TV demodulator. An external continuous adjustment provides a -10 to +8 dBm/600 Ω wide range of input audio signal for nominal deviation or modulation depth.

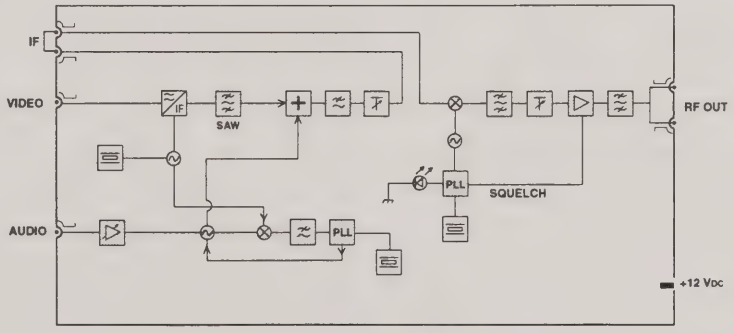
The heterodyne conversion SAW filtered is designed for proper vestigial sideband selectivity. It enables the equipment be used in adjacent channel systems.

The IF loop-through capability provides access before channel conversion. This feature allows to replace standard internally generated IF with an alternate composite IF (stereo sound) or allows insertion of IF video/audio scrambling equipments.

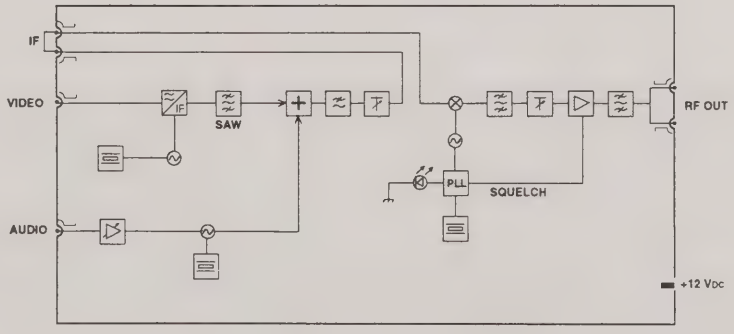
Frequency synthesis circuitry operation is checked by a LED indicator. A squelch circuit is activated when PLL unlocking, so no unwanted spectral components are generated.

The use of a passive, high selectivity single-channel filter assures a spurious-free RF output.

BLOCK DIAGRAM



TV systems
B - G - D - I - K - M - N



TV systems
L - L'

TSP - TV MODULATORS

TECHNICAL DATA

Model				**MEC-410**	**MEC-430**	**MEC-440**	**MEC-411**	**MEC-431**	**MEC-441**
Ref.				**3700**	**3704**	**3708**	**3702**	**3706**	**3710**
Output TV channels allocated between:			**MHz**	**12 - 100**	**100 - 300**	**300 - 862**	**12 - 100**	**100 - 300**	**300 - 862**
TV systems				**B - G - I - D - K - M - N**			**L - L'**		
RF output section	Termination cap for single output (!)			Open (green)		Short c. (red)	Open (green)		Short c. (red)
	Nominal output level		**dBµV**	**108** (1)					
	Output level stability		**dB**	**±0.75**					
	Output level adjustment		**dB**	**-20**					
	Carriers' level ratio (internal adjustment)		**dB**	**12** (10 ... 16)					
	Carriers' frequency tolerance		**kHz**	**< ±10**					
	VSB response	f_v - 1,5 MHz (2)	**dB**	**>65**					
		f_v - 4,4 MHz (3)	**dB**	**>65**					
	Spurious in band		**dBc**	**< -70**					
	C/N ratio in channel (4)		**dB**	**57**					
	Output impedance		Ω	**75** (1)					
	Output return loss		**dB**	**>15** (1)					
IF section	Video carrier frequency		**MHz**	**38.9** (B-G-I)		**38** (D-K)	**45.75** (M-N)		**38.9** (L)
	Audio carrier frequency		**MHz**	**33.4** (B-G) **32.9** (I)		**31.5** (D-K)	**41.25** (M-N)		**32.4** (L)
	Video carrier output level		**dBµV**	**85** (±1)					
	Audio carrier output level (internal adjustment)		**dBµV**	**73** (75 ... 69)					
	Input/output impedance		Ω	**75**					
	Input/output return loss		**dB**	**≥15**					
Video section	Input level		**V_{pp}**	**0.7 ... 1.4**					
	Modulation depth		**%**	**90**					
	Flatness in band		**dB**	**±0.75**					
	Weighted S/N ratio		**dB**	**>60**					
	Differential gain		**%**	**<3**					
	Differential phase		°	**<2**					
	Cr/L delay		**ns**	**< ±25**					
	K-factor (2T pulse)		**%**	**<2**					
	Input impedance		Ω	**75**					
	Input return loss		**dB**	**≥20**					

(1) Values refer to single output configuration. In this case, discarded outlet must be fitted with special termination cap. See (!).
When both outlets are used ("Z" mode), a level reduction (about 3.5 dB) due to power splitting should be taken into account to calculate global values. Then cascade termination must be conventional 75 Ω load.

(2) In I-L systems: f_v - 2.0 MHz.

(3) In M-N systems: f_v - 3.5 MHz.

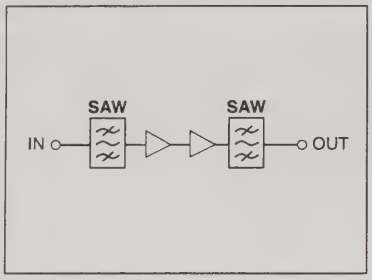
(4) Bandwidth: 5 MHz

TSP - TV MODULATORS

TECHNICAL DATA (cont'd)

Model			MEC-410	MEC-430	MEC-440	MEC-411	MEC-431	MEC-441
Ref.			3700	3704	3708	3702	3706	3710
Output TV channels allocated between:		MHz	12 - 100	100 - 300	300 - 862	12 - 100	100 - 300	300 - 862
TV systems			B - G - I - D - K - M - N			L - L'		
Audio section	Input level (external adjustment)	dBm	0 (-10 ... +8)					
	Pre-emphasis	µs	50			–		
	Adjustable peak deviation	kHz	±10 to ±50			–		
	Adjustable modulation depth	%	–			10 to 80		
	S/N ratio	dB	>60					
	Distortion (fm=1 kHz; Δf=25 kHz)	%	<1			–		
	Input impedance	Ω	600					
General	Supply voltage	Vdc	+12					
	Consumption	mA	520					
	Operating temperature	°C	-10 ... +55					
	Video, IF and RF connector type		"F"					
	Audio connector type		"RCA"					
	Outside dimensions (h x w x d)	mm	126 x 35 x 225					
	Assembly option feasability		**Single** and **Double**					
	Packed weight	kg	0.940					

TSP - TV MODULATORS

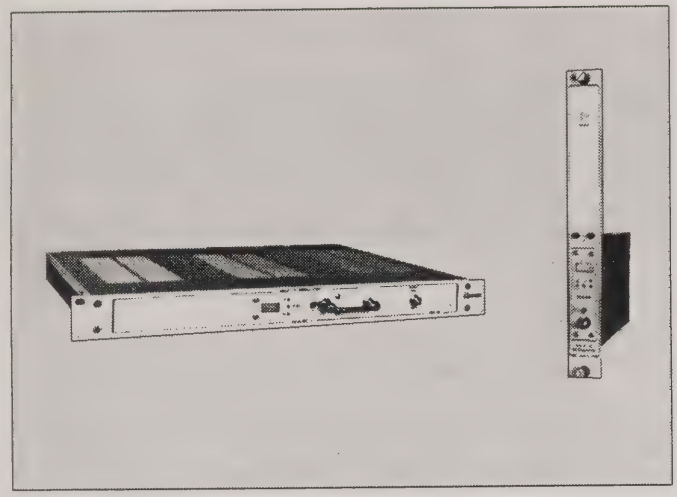


IF FILTERS	(See below)
Indispensable for the operation of the equipment: 1 Modulator→1 Filter. Internal mounting. Factory assembly according to the order.	

Model	SAW-200	SAW-201	SAW-202	SAW-203	SAW-202
Ref.	2622	2623	2624	2625	2624
TV system	B / G	D / K	I	M / N	L

The appropriate filter will be selected in terms of the output channel TV system. So, for example, the required model for a System G modulator will be SAW-200 (Ref. 2622).

TSP - AGILE TV MODULATORS



- Agile selection of any TV channel in three frequency ranges (5-300 MHz, 45-550 MHz or 470-862 MHz). Systems: B, G, I, D, K, M, N, L.
- True VSB response.
- Microprocessor controlled. Selection pushbuttons. LCD display.
- External IF loop. Compatible with stereo sound and scrambling systems.
- Adjustable RF output level.
- Optional digital control.

FUNCTIONAL DESCRIPTION

The «MCA-400» Series agile TV modulators provide audio and video modulated RF signals on a TV channel which is selectable throughout each of three frequency ranges: 5-300 MHz, 45-550 MHz or 470-862 MHz. Agile selection feature permits on-the-fly channel changes and reduces the need for large inventories of product. Any standard audio/video source can be used: satellite receiver, TV camera, video tape recorder or TV demodulator; stereo sound sources may be used through two available audio inputs (see Block Diagram).

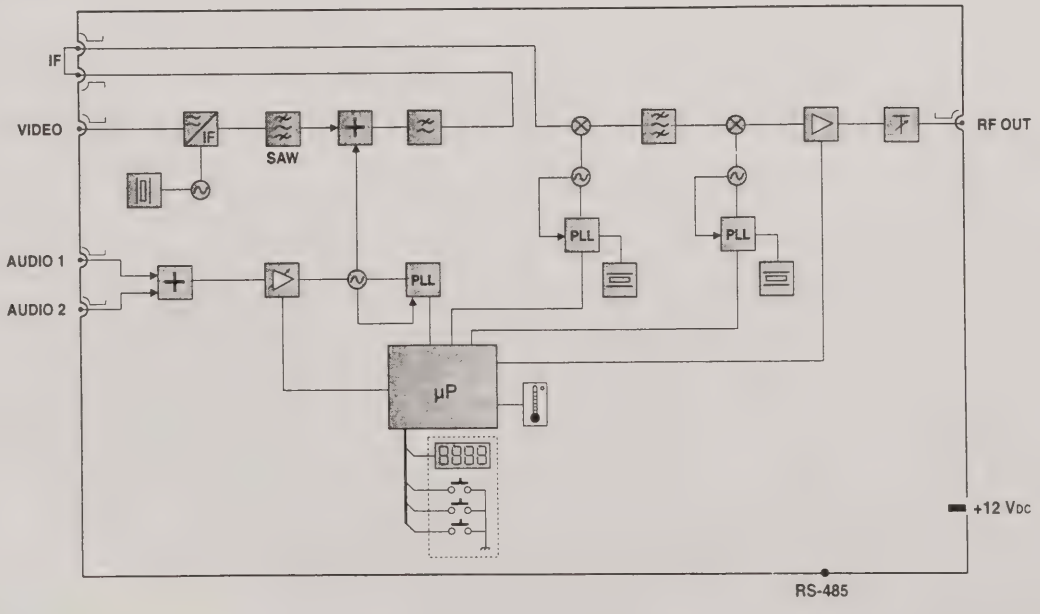
Three pushbuttons on the front panel operate on a built-in microprocessor which selects the Video Carrier Frequency (50 kHz increments), the Video/Audio Carrier Distance (4.5 MHz, 5.5 Mhz, 6.0 MHz or 6.5 MHz), the Carrier Level Ratio (10 to 17 dB) and the Audio Modulation Index. A comprehensive liquid crystal display, whose position on the panel is an option to be reflected in the order –horizontal or vertical mounting–, reports the performed selections, as well as the internal temperature of the module and possible hardware failures.

The modulation process operates on a local crystal-controlled IF signal, which via SAWF is directed to a double frequency conversion that uses PLL synthesized local oscillators. SAWF filtering provides true VSB (Vestigial Side Band) response and enables the modulator to be used in adjacent channel systems. An external IF loop permits to replace the internally generated standard IF with an alternate composite IF –stereo or dual sound–, as well as to apply signal scrambling systems; it makes also possible, should the need arise, to use an Agile Modulator as Up-Converter module of a TV Channel Processor (page 2C.1).

The output signal is extremely clean (spurious at 70 dB typ); in order to keep this feature up under PLL failures, the RF output is automatically cut down –minimum drop: 70 dB– if that occurs. On the other hand, an exceptionally low broadband noise floor (-73 dBc or better) permits in a headend the use of multiple modulators with a very little deterioration of the C/N ratio: less than 2 dB of reduction with total occupation of the band by using adjacent channel modules.

A *Digital Control Option* (page 2F.7) may be fitted to the modulator for remote configuration and monitoring from a PC or Data Terminal.

BLOCK DIAGRAM



TSP - AGILE TV MODULATORS

TECHNICAL DATA

				Being developed			Being developed	Being developed	Being developed	Being developed		
Model				**MCA-410**	**MCA-430**		**MCA-440**	**MCA-411**	**MCA-431**	**MCA-441**		
Ref.				**xxxx**	**3550**		**xxxx**	**xxxx**	**xxxx**	**xxxx**		
Selectable TV channel allocated between:			**MHz**	**5 - 300**	**45 - 550**		**470 - 862**	**5 - 300**	**45 - 550**	**470 - 862**		
TV system				**B - G - I - D - K - M - N**				**L - L'**				
RF output section	Nominal output level		**dBµV**	**108**								
	Output level stability		**dB**	**±0.75**								
	Continuous output level adjustment		**dB**	**-15**								
	Video carrier frequency tolerance		**kHz**	**< ±10**								
	Carrier level ratio		**dB**	**10 ... 17** (1 dB increments)								
	Carrier level ratio tolerance		**dB**	**±1.5**								
	Video/audio carrier distance		**MHz**	**4.5 - 5.5 - 6.0 - 6.5**								
	VSB response	fv -1.5 MHz [1]	**dB**	**>65**								
		fv -4.4 MHz [2]	**dB**	**>65**								
	Spurious in band		**dBc**	**< -70**								
	C/N ratio in channel [3]		**dB**	**≥57**								
	Broadband noise [3]		**dBc**	**< -73**	**< -73**		**< -78**	**< -73**	**< -73**	**< -78**		
	Output impedance		**Ω**	**75**								
	Output return loss	5-45 MHz	**dB**	**≥18**								
		45-862 MHz	**dB**	**≥18** (at 45 MHz; -1.5 dB/oct. from 45 to 862 MHz)								
IF section	Video frequency		**MHz**	**38.9** (B-G-I)			**38** (D-K)	**45.75** (M-N)		**38.9** (L)		
	Audio frequency		**MHz**	**33.4** (B-G) **32.9** (I)			**31.5** (D-K)	**41.25** (M-N)		**32.4** (L)		
	Video carrier output level		**dBµV**	**85 (±1)**								
	Adjustable audio carrier output level		**dBµV**	**75 ... 68** (1 dB increments)								
	Input/output impedance		**Ω**	**75**								
	Input/output return loss		**dB**	**≥15**								
Video section	Input level		**V_{pp}**	**0.7 ... 1.4**								
	Modulation depth		**%**	**88 ±2**				**92 ±2**				
	Flatness in band		**dB**	**±0.5**								
	Weighted S/N ratio		**dB**	**>60**								
	Differential gain		**%**	**<3**								
	Differential phase		**°**	**<2**								
	Cr/L delay		**ns**	**< ±25**								
	K-factor (2T pulse)		**%**	**<2**								
	Input impedance		**Ω**	**75**								
	Input return loss		**dB**	**≥20**								

(1) In I-L systems: f_v - 2.0 MHz.

(2) In M-N systems: f_v - 3.5 MHz.

(3) Bandwidth: 5 MHz.

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TSP - AGILE TV MODULATORS

TECHNICAL DATA (cont'd)

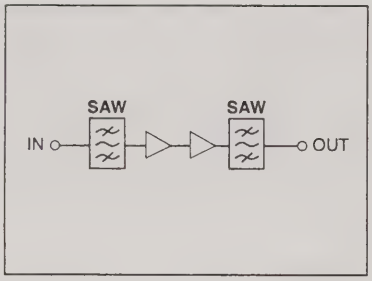
			Being developed		Being developed	Being developed	Being developed	Being developed
Model			**MCA-410**	**MCA-430**	**MCA-440**	**MCA-411**	**MCA-431**	**MCA-441**
Ref.			**xxxx**	**3550**	**xxxx**	**xxxx**	**xxxx**	**xxxx**
Selectable TV channel allocated between:		**MHz**	**5 - 300**	**45 - 550**	**470 - 862**	**5 - 300**	**45 - 550**	**470 - 862**
TV system			**B - G - I - D - K - M - N**			**L - L'**		
Audio section	Input level	V_{pp}	0.5 ... 2.0					
	Pre-emphasis	µs	50			–		
	Adjustable peak deviation	kHz	±10 to ±50			–		
	Adjustable modulation depth	%	–			10 to 80		
	S/N ratio	dB	>60					
	Distortion (fm=1 kHz; Δf=25 kHz)	%	< 1			–		
	Input impedance	kΩ	>10					
General	Supply voltage	V_{DC}	+12					
	Consumption	mA	730	750	650	730	750	650
	Operating temperature	°C	-10 ... +55					
	Video, IF and RF connector type		"F"					
	Audio connector type		"RCA"					
	Selection and status indicator		LCD					
	Outside dimensions (h x w x d)	mm	126 x 35 x 225					
	Assembly option feasability		**Single** (TSP-5 series) - **Single** and **Double** (TSP-19 series)					
	Packed weight	kg	1.250					

Digital Control Option

This additional sub–unit accepts a serial RS-485 data input to control the modulator from a PC or a Data Terminal. It allows remote changes of any the output frequency, carrier distance, carrier level ratio and audio modulation index, as well as to cut down the proper output RF signal and to perform a status monitoring (frequency, carrier ratio, audio, PLLs, internal temperature).

Model	**xxx-xxx**
Ref.	**xxxx**
DEVELOPING UNIT	

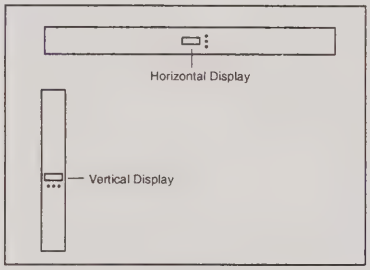
TSP - AGILE TV MODULATORS



IF FILTERS	(See below)
Indispensable for the operation of the equipment: 1 Modulator→1 Filter. Internal mounting. Factory assembly according to the order.	

Model	SAW-200	SAW-201	SAW-202	SAW-203	SAW-202
Ref.	2622	2623	2624	2625	2624
TV system	B / G	D / K	I	M / N	L

The appropriate filter will be selected in terms of the output channel TV system. So, for example, the required model for a built-in IF high selectivity filter, system G modulator will be SAW-200 (Ref. 2622).



DISPLAY & ASSEMBLY	(See below)
Related to the Mounting Options of «MCA-400» modulators. Two choices for two mounting options: Vertical Display (module in TSP-5 version) or Horizontal Display (module in TSP-19 version). Compulsory to be reflected in the order.	

Model	IAV-105	IAH-119
Ref.	3608	3610
Description	Vertical Display (module in TSP-5 version)	Horizontal Display (module in TSP-19 version)

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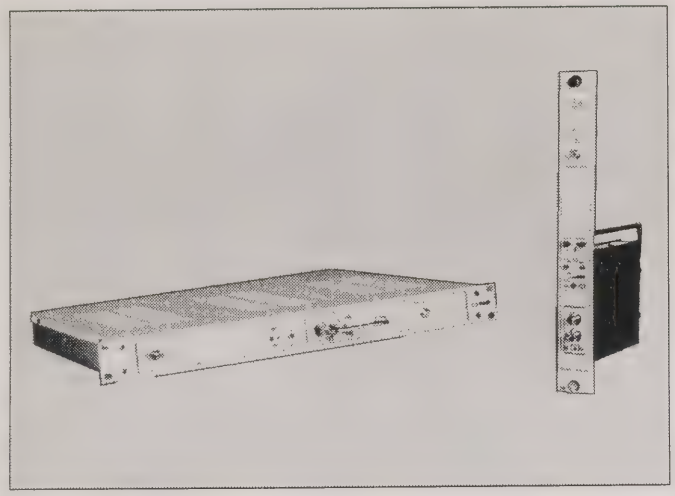
TSP - FM RADIO AMPLIFIERS



- Global amplification of FM Radio band.
- Delayed AGC. Reference on the highest reception level.
- Output level limiter circuit.
- Input level status display (high - OK - low).
- Adjustable RF output level.

FUNCTIONAL DESCRIPTION

The equipment performs a global, direct amplification of the FM Radio band. Passive, high selectivity band-pass filters at the input and output ports provide excellent RF selectivity, so avoiding interference phenomena from strong adjacent channels and assuring a spurious-free output spectrum.

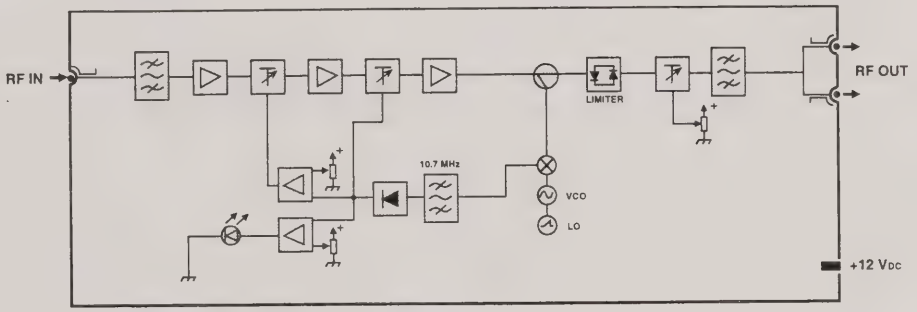
The gain is controled by an AGC circuitry based on a sweep VCO oscillator and a supradyne conversion which put all FM channels in a 10.7 MHz IF, its level serving as reference in the generation of a control voltage which provides therefore an AGC operation handled by the highest level of receiving channels.

The very low (< 3 dB) noise figure of the equipment and the delayed control at the RF input stage maintain excellent S/N ratio in all FM channels amplified.

To protect the system against an excessive output level which can disturb the whole installation, a dual Schottky diode is used as an output level limiter (110 dBµV max).

A colour changing LED on the front panel displays input level status to check if AGC pull-in range is overridden.

BLOCK DIAGRAM



TSP - FM RADIO AMPLIFIERS

TECHNICAL DATA[1]

Model			REC-420	REC-421
Ref.			3734	3736
Frequency range		**MHz**	**87.5 - 108**	**66 - 73**
Termination cap for single output (!)			Open (green)	
Input and output impedance		Ω	75	
Input and output return loss		dB	≥ 15	
Input level		dBµV	50 ... 90	
Noise figure		dB	< 3	
Nominal output level		dBµV	100	
IMD3 (2 carriers) for nominal output level		dB	82	
Output level adjustment		dB	-20	
Output level stability		dB	± 1	
Selectivity	f ≤ 80 MHz	dB	≥ 40	–
	f ≥ 120 MHz		≥ 48	–
Selectivity	f ≤ 57 MHz	dB	–	≥ 30
	f ≥ 84 MHz		–	≥ 35
Supply voltage		V_{DC}	+12	
Consumption		mA	150	
Operating temperature		°C	-10 ... +55	
RF connector type			"F"	
Outside dimensions (h x w x d)		mm	126 x 35 x 225	
Supplied accessories			Front RF output coaxial bridge	
Assembly options feasability			Single	
Packed weight		kg	0.860	

(1) Values refer to single output configuration. In this case, discarded outlet must be fitted with special termination cap. See (!).
When both outlets are used ("Z" mode), a level reduction (about 3.5 dB) due to power splitting should be taken into account to calculate global values. Then cascade termination must be conventional 75 Ω load.

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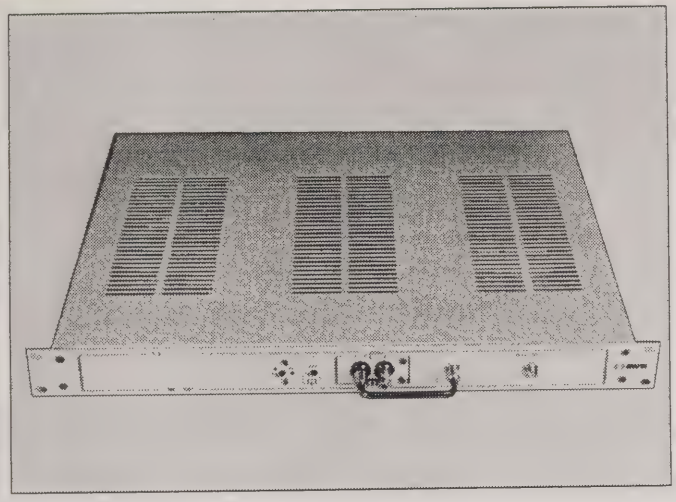
TSP - PILOT CARRIER GENERATOR



- Two pilot carriers, lower and upper frequencies.
- Frequencies genetation by PLL synthesizer and VCO.
- Individually adjustable output levels.
- Output test outlet.

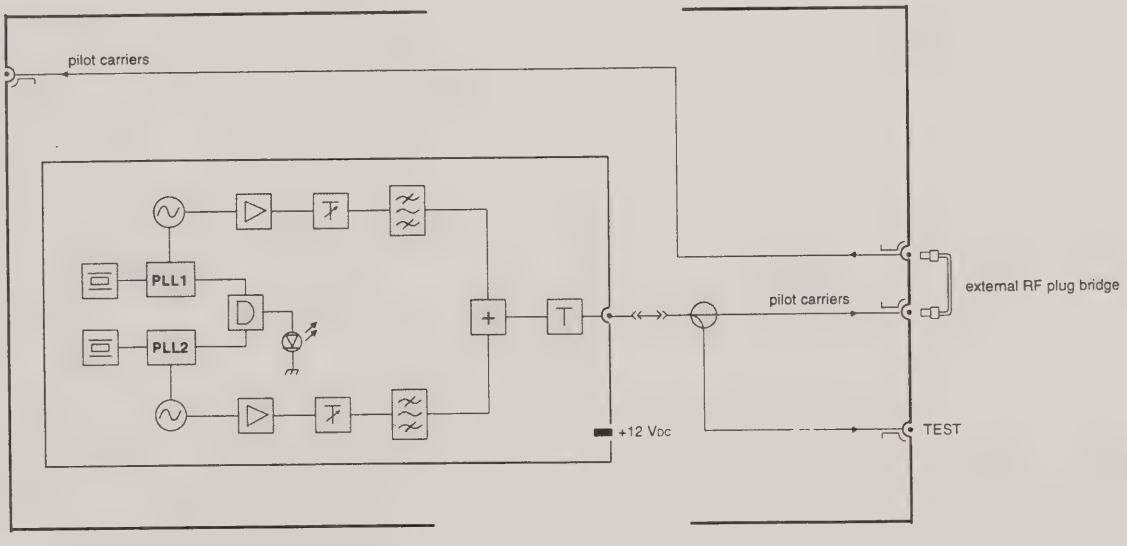
FUNCTIONAL DESCRIPTION

The LEC-400 produces two pilot signals for automatic gain- level and slope correction in CATV line amplifiers with ALSC.

The equipment generates, amplifies, filters and adds up two stable, quartz controlled pilot carriers, which are available from both the front and the rear panels of the unit, for connexion to either the EEC-409 or the EEC-400 multiplexers (pages 2I.1 and 2I.2).

On the front panel, two potentiometers and one test outlet facilitate individual adjustment of the output levels. A LED indicator checks frequency synthesis process.

BLOCK DIAGRAM



IKUSI

TSP - PILOT CARRIER GENERATOR

TECHNICAL DATA

Model		LEC-400
Ref.		**2595***
Lower pilot frequency (1)	**MHz**	**49.75 – 67.25 – 119.25 – 415.25**
Upper pilot frequency (1)	**MHz**	**288.25 – 415.25 – 535.25 – 861.75**
Output level of each pilot carrier	**dBµV**	**108** (±1)
Output level stability	**dB**	**± 0.5**
Output level adjustment of each pilot carrier	**dB**	**-10**
Test outlet for both carriers	**dB**	**-14**
Output and TV channels input impedance	Ω	**75**
Input and output return loss	**dB**	**≥ 16**
Frequency stability	**ppm**	**± 3**
Harmonic outputs	**dBc**	**< - 60**
Noise level in band	**dBm/MHz**	**< - 83**
Supply voltage	**VDC**	**+12**
Consumption	**mA**	**290**
Operating temperature	**°C**	**0 ... +50**
RF and Test connector type		**"F"**
Outside dimensions (h x w x d)	**mm**	**126 x 35 x 202**
Assembly option feasability		OMS-119 only
Packed weight	**kg**	**0.830**

(1) The available values, specifically dedicated to IKUSI CATV amplifiers, are indicated. Pilot frequencies other than those shown may be specially ordered. Please contact regarding application and availability.

(*) This reference, to be extinguished, fits the equipment in TSP-5 vertical mounting type. The advanced information pointed out at the preceding page refers to the new, being developed LEC-400 model

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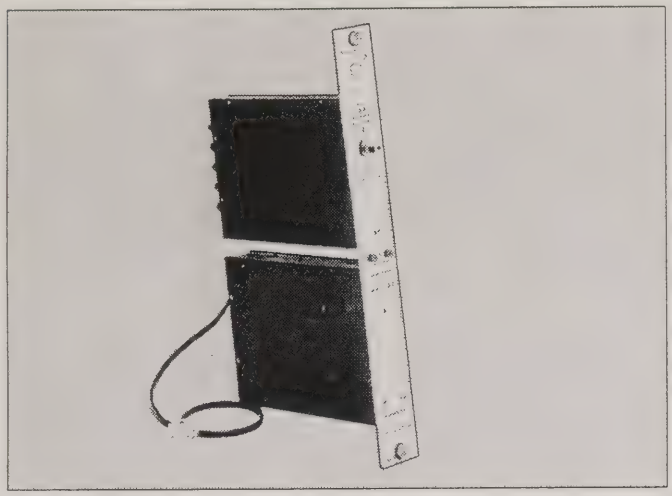
IKUSI

TSP-5 - SATELLITE TV SPLITTER



The *DEC-410* splitter is used to provide 950-2050 MHz IF signals to several satellite TV receivers from one antenna/LNB combination.

The equipment, which features 4 distribution outputs plus 1 "extension" output, contains an internal amplifier to maintain the input signal level in the four distribution outputs. Two external +12 VDC and +18 VDC input connexions are used to provide power the amplifier and the LNB unit; both voltages are supplied by the PEC-400 power supply (in the photo, the splitter and the power supply in a double assembly).

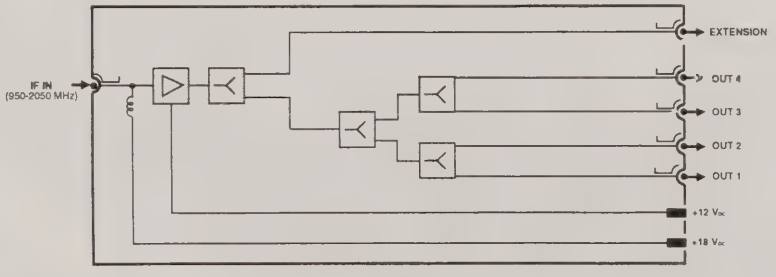
The extension output performs a 1 input – 8 outputs configuration through its connexion to another DEC-410 splitter.

TECHNICAL DATA

Model		**DEC-410**
Ref.		**3740**
RF ports		**1 input - 4 outputs - 1 extension**
Frequency range	**MHz**	**950 - 2050**
Input/output impedance	**Ω**	**75**
Return loss	**dB**	**≥ 10**
Splitting outputs gain	**dB**	**0** (±1.5)
Extension output gain	**dB**	**6** (±1.5)
Noise figure	**dB**	**6**
Third order intercept point	**dBm**	**10**
Isolation	**dB**	**> 24**
Supply voltage	**VDC**	**+12**
Consumption	**mA**	**20**
LNB powering max thru current (+18 V)	**mA**	**500**
Operating temperature	**°C**	**-10 ... +55**
RF connector type		**"F"**
Outside dimensions (h x w x d)	**mm**	**126 x 32 x 225**
Assembly options feasability		Double only (1)
Packed weight	**kg**	**0.9**

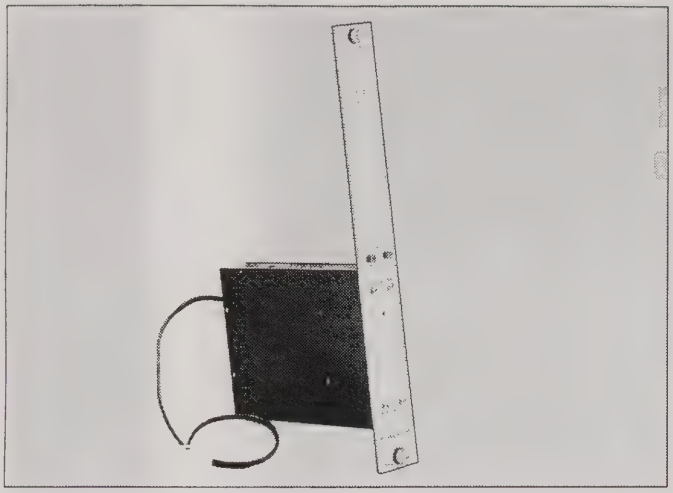
(1) The DEC-410 must be installed with the PEC-400 power supply (see next page). Both are subsystems of the "Satellite TV active splitter" module (see photo above).

BLOCK DIAGRAM



IKUSI

TSP-5 - POWER SUPPLY UNIT



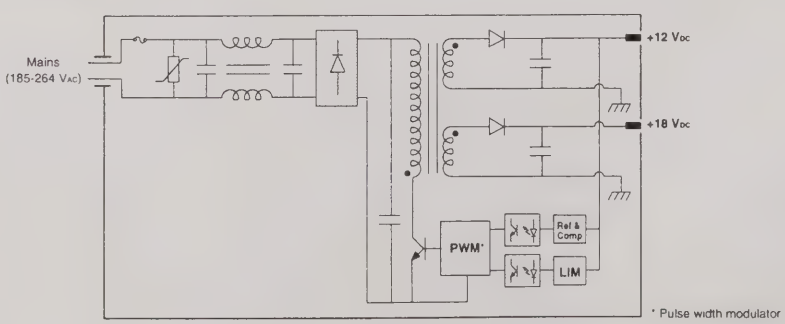
- To supply power to the active modules of the TSP-5 series and to the LNB units in TV satellite reception.
- Switch mode type. Efficiency 75%.
- High protection against power line noise and transients.
- Overvoltage limiter circuitry on the output.
- Conducted EMI suppresion according to VDE 0871 level B.

TECHNICAL DATA

Model		PEC-400
Ref.		3742
Mains supply	VAC	185 - 264
Output voltages	VDC	+12 (±5%) +18 (-0; +10%)
Max +12 V output current	A	4.3
Max +18 V output current	A	0.5
Output voltage regulation	%	2
Ripple voltage	mV	< 50
Max power consumption	W	70
Mains fuse	A	2
Operating temperature	°C	-10 ... +55
Dimensions (h x w x d)	mm	126 x 35 x 190
Assembly options feasability		Single
Packed weight	kg	0.9

- Patch-cord (1.5 m) with plug. Intermediate in-line splice which makes it easy to remove the module from the cabinet.

INTERNAL DIAGRAM



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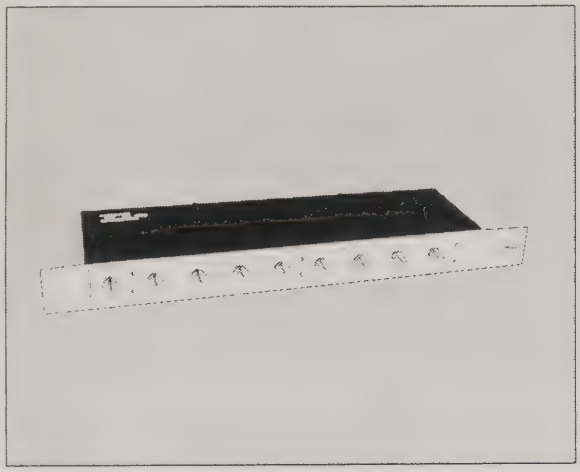
IKUSI

TSP-5 - EEC-409 MULTIPLEXER



The *EEC-409* is a «8 input + 1 "extension"» passive output multiplexer presented in a 19"-1u modular format.

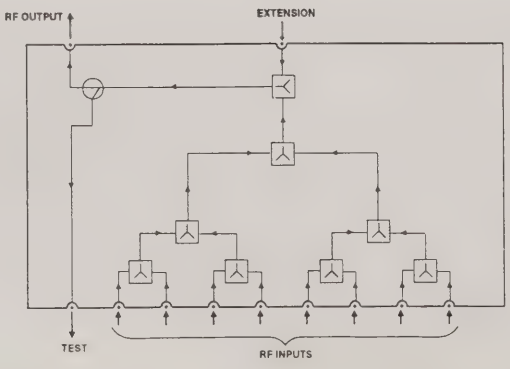
The extension input allows use of 2 and 3 multiplexers to combine up to 16 and 24 channels respectively (see page 2A.3). Output unlevelling is corrected by the 0-20 dB RF output attenuators in the selective modules (amplifiers, processors, modulators).

A test outlet on the front panel allows checking of the headend output level without disconnecting any equipment.

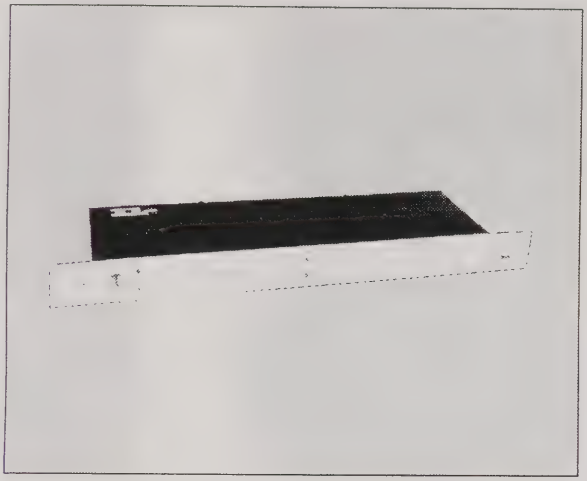
TECHNICAL DATA

Model		**EEC-409**
Ref.		**3738**
Number of inputs		**8 + 1 ext.**
Frequency range	**MHz**	**40 - 862**
Input and output impedance	**Ω**	**75**
Input return loss	**dB**	**≥ 18**
Output return loss	**dB**	**≥ 15**
Insertion loss – @862 MHz	**dB**	**18** (±1)
Slope	**dB**	**3**
Extension input loss	**dB**	**≤ 5**
Input isolation	**dB**	**≥ 22**
Test outlet	**dB**	**-30** (±1)
Operating temperature	**°C**	**-10 ... +55**
RF and test connector type		**"F"**
Dimensions (h x w x d)	**mm**	**44** (1u) x **483** (19") x **168**
Packed weight	**kg**	**2.250**

INTERNAL DIAGRAM



TSP - EEC-400 MULTIPLEXER



The *EEC-400* is a passive multiplexer with 8 broadband input ports, presented in a 19"-1u modular format.

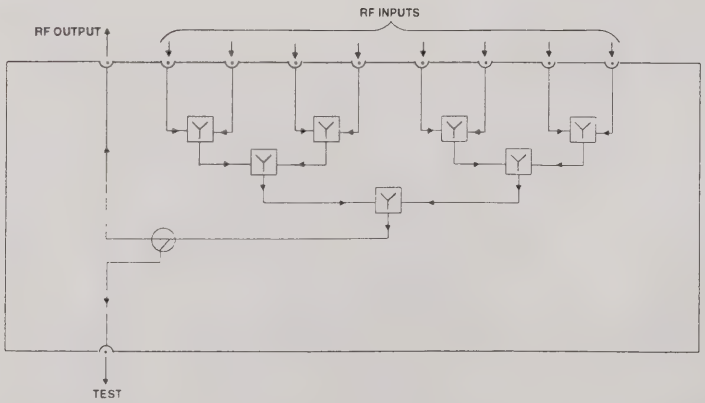
All RF ports –inputs and output– are located on the rear side, that facilitates the use of the equipment as a group combiner in a second level multiplexing. In "TSP-19" headends, 1 to 9 EEC-400 units allow combining of 2 to 64 channels (see page 2A.5). In large systems –25 to 64 channels– "TSP-5" headends, the EEC-400 is used to combine the outputs of 4 to 8 EEC-409 multiplexers (see page 2A.3).

A test outlet on the front panel allows checking of the headend output level without disconnecting any equipment.

TECHNICAL DATA

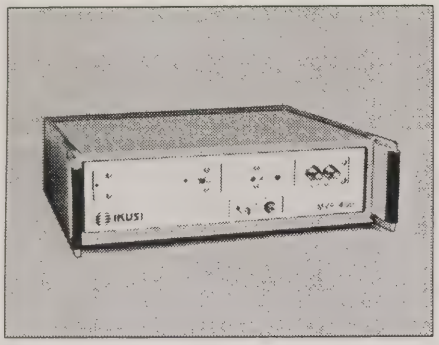
Model		**EEC-400**
Ref.		**2592**
Number of inputs		**8**
Frequency range	**MHz**	**40 - 862**
Input and output impedance	Ω	**75**
Input return loss	**dB**	≥ **18**
Output return loss	**dB**	≥ **15**
Insertion loss – @862 MHz	**dB**	**13** (±0.5)
Slope	**dB**	**3**
Input isolation	**dB**	≥ **22**
Test outlet	**dB**	**-30** (±1)
Operating temperature	**°C**	**-10** ... **+55**
RF and test connector type		"**F**"
Dimensions (h x w x d)	**mm**	**44** (1u) x **483** (19") x **168**
Packed weight	**kg**	**2.250**

INTERNAL DIAGRAM



908024

TSP - HEADEND RF ACCESSORIES



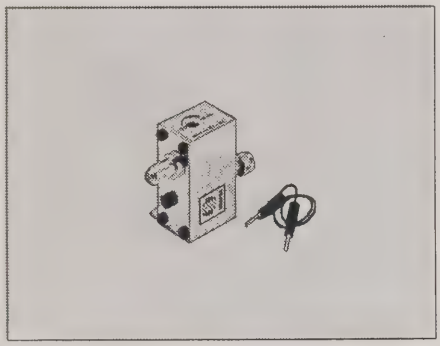
(*) TV-channels recommended (video carrier):
VR2 (24.25 MHz); VR3 (41.25 MHz); VR4 (48.25 MHz).

COMPACT MODULATOR FOR REVERSE WAY	MVR-400 Ref. 2560	MVR-410 Ref. 2561
TV systems	B-I-D-K'-M-N	L'

- VSB TV-channel between 12 and 55 MHz. (*)
- Mains supply: 185 - 264 VAC. ON/OFF switch.
- Shielded box of 300 x 87 x 288 mm
- Packed weight: 3.5 kg

(Connectors and RF, video and audio characteristics as *MEC-410 / MEC-411* models; see pages 2F.2 and 2F.3).

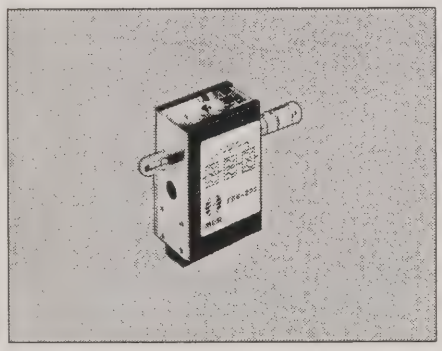
PARTICULAR ORDERING INSTRUCTIONS:
- For *MVR-400* model, specify channel and TV system.
- For *MVR-410* model, specify TV channel.
- IMPORTANT: For both models, the appropriate IF Filter must be noted additionally (see page 2F.4).



RF / DC DIPLEXER - ATTENUATOR — IAR-300 Ref. 2594

To remote powering of mast-head amplifiers. Pluggable to headend antenna input connectors. +24 VDC connexion to banana jacks on the Ref. 2607 cabinet rear panel.

- Frequency range: 47 - 862 MHz
- Insertion loss adjustment: 1 ... 21 dB
- Max DC current: 300 mA (at +24 V).
- Shielded box of 60 x 60 x 40 mm. "F" type connectors.
- Packed weight: 80 g



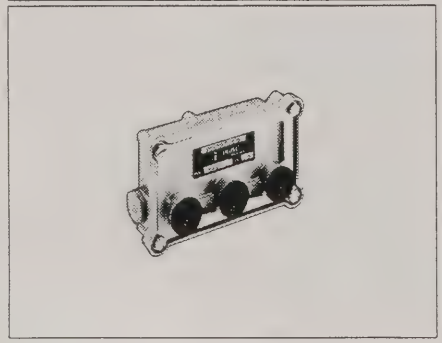
FM VARIABLE TRAP — FRB-203 Ref. 2593

To attenuate 1, 2 or 3 FM channels in the 87.5 - 108 MHz band. Pluggable to headend FM Radio antenna input connector.

- Rejection: 34, 28 or 22 dB (adjustment on 1, 2 or 3 different frequencies).
- Shielded box of 75 x 85 x 30 mm. "F" type connectors.
- Packed weight: 220 g

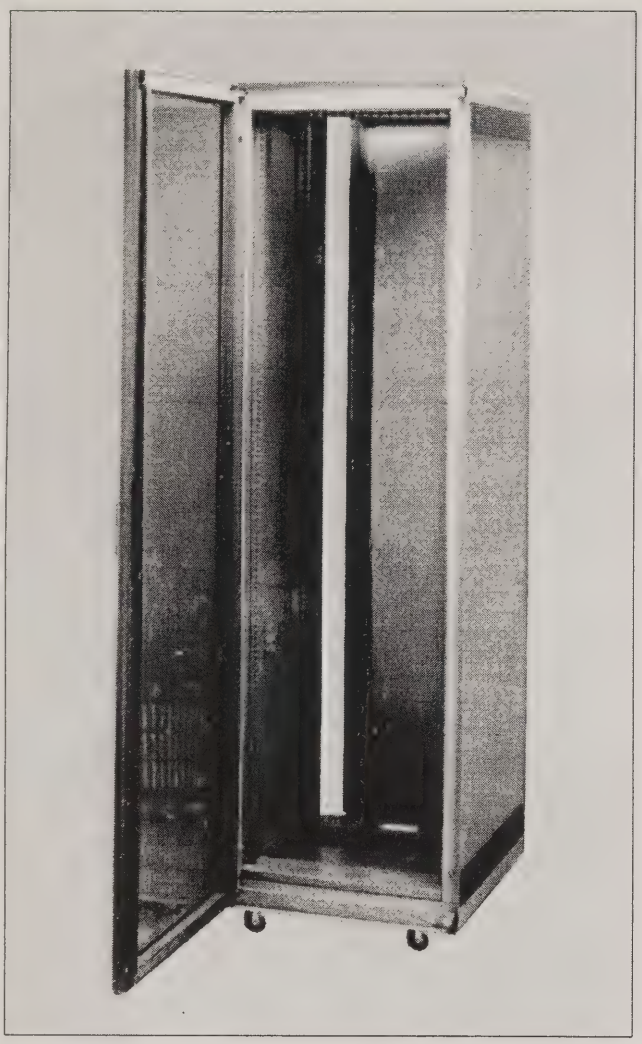
REVERSE WAY DIPLEXERS

Used to separate forward (FW) and reverse (RW) signals in a two-way CATV system. One 5-862 MHz input and two –FW and RW– outputs on 5/8" type connectors. Shielded, 125 x 75 x 55 mm sized box for outdoor use. Wall or pipe-fixing through the Ref. 1371 angle-holder.



Model		TER-803	TER-805
Ref.		2608	2609
RW output - Frequency range	MHz	5 - 30	5 - 55
FW output - Frequency range	MHz	47 - 862	86 - 862
Insertion loss	dB	0.3	
Packed weight	g	560	

TSP-19 AND TSP-5 HEADENDS - CABINETS



"TOP LINE" CABINETS

Manufactured exclusively from metal, these cabinets show a high quality finishing, being the most appropriate complement for a well assembled professional headend.

They are delivered either empty or with already mounted modules (factory mounted option chosen, only in TSP-5 version; see next page, below); for the latter case, a general electrical test and special shipping package are included. In both cases, special panels –upper and back ones– with blowing units, as well as mains distribution units with (6x) *Schuko* type sockets, are included.

The most reasonable mechanical options have been selected for each size and utility, as shows the following table.

The front coloured methacrylate cover makes easy to survey pilots and alarms at the time that avoids unauthorized access to the equipment. A similar function is carried out by the rear door. Both of them are lockable.

The blowing units are dimensioned according to the use and the air volume to be removed, which also depends on the cabinet size. Wheels make repairs, tests and movements easy, specially for big size models.

Other extra options could be available upon request (lifting eye bolts, and so on).

19" TOP LINE CABINETS		RIT-510	RIT-518	RIT-531	RIT-542
Ref.		**3806**	**3808**	**3810**	**3812**
High units capacity	**u**	10	18	31	42
Number of back blowing units	**Pc**	1	2	3	4
Number of upper blowing units	**Pc**	4	4	4	4
Number of mains distribution units (6x)	**Pc**	2	3	4	5
Transport wheels		No	No	Yes	Yes
Dimensions (h x w x d)	**mm**	645 x 600 x 650	1000 x 600 x 650	1600 x 600 x 650	2090 x 600 x 650
Packed weight (empty)	**kg**	51	65	96	123

TSP-5 HEADEND - CABINETS

19" STANDARD CABINETS

Built in on aluminium frame with synthetic resin pieces, this cabinet is a real low-cost solution for TSP-5 series assembly.

They are usually delivered disassembled and optionally with mounted-in modules (factory assembly option). In the first case, small size makes transport easy. In the second one, the headend is delivered with a special protective package, as well as mounted, meassured and tested. It can also be prealigned to operational levels if required by the user. In both cases, special rear panels with blowing units are included, one of them with a +24 V_{DC} auxiliary power supply for preamplifiers. Other panels upon request.

19" STANDARD CABINETS		RAC-510	RAC-520	RAC-530
Ref.		**3800**	**3802**	**3804**
High units capacity	**u**	10	20	30
Number of 4u rear panels with blowing units	**Pc**	1	2	3
Power supply	**VDC/A**	24/1	24/1	24/1
Dimensions (h x w x d)	**mm**	490 x 525 x 400	935 x 525 x 400	1370 x 525 x 400
Packed weight (empty)	**kg**	11.8	18.5	25.5

IN-FACTORY ASSEMBLY OPTIONS		OMF-520	OMF-530
Ref.		**3618**	**3620**
Cabinet size	**u**	10/20	30
Option available for series		TSP-5	TSP-5

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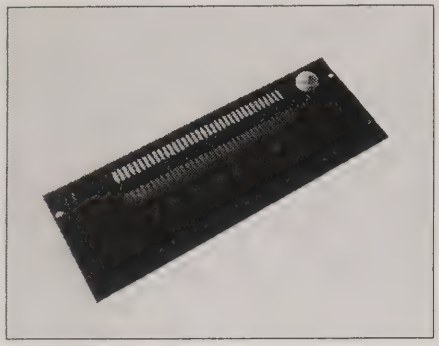
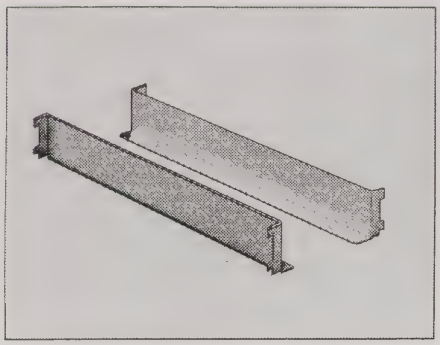
TSP-5 - CABINET ACCESSORIES



CABINET REAR PANELS	(See below)
To install in the standard and "Top line" cabinets. Metalics, with eposy paint. Holes to fit the "F" feed-through connectors of the module access connecting cables.	

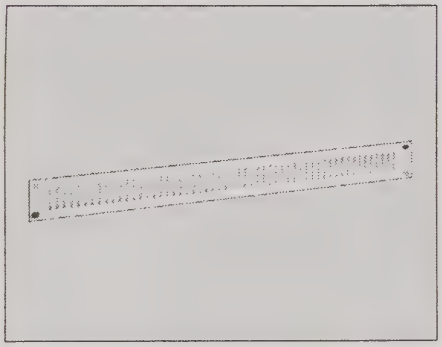
Model	TAC-401	TAC-402	TAC-403	TAC-400
Ref.	2607	2614	1353	2606
Usage	Satellite reception and/or terrestrial reception using mast-head amplifiers.	Satellite reception and/or terrestrial reception without using mast-head amplifiers.	"Blank"	"Blank"
Holes for "F" double female connectors (Headend's RF access)	10	10	–	–
Banana jacks with Vdc availability for RF-DC diplexers	9	–	–	–
Mains outlet	1	1	–	–
Dimensions	19" - 4u (483 x 178 mm)	19" - 4u (483 x 178 mm)	19" - 4u (483 x 178 mm)	19" - 2u (483 x 89 mm)
Packed weight	700 g	700 g	700 g	360 g

TSP-19 - CABINET ACCESSORIES



SUPPORT ANGLES	GIT-502 Ref. 3624

- Angles provide 25 mm of horizontal surface along each side for supporting the horizontal format TSP-19 modules.
- Two units. Packed weight: 400 g.



1u VENTILATION FRONT PANEL	FIT-501 Ref. 3626

- Alternate fitting with the horizontal format TSP-19 modules with the purpose to allow ventilation for the later ones being installed in a "Top line" cabinet.
- Dimensions: 19" x 1u (483x44.5 mm). Packed weight: 120 g.

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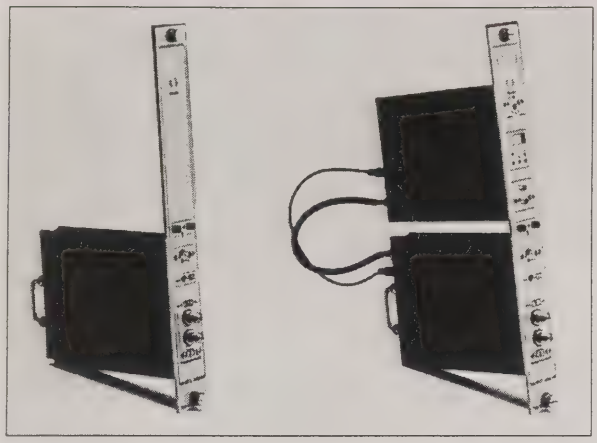
TSP-5 VERTICAL SERIES - OPTIONS

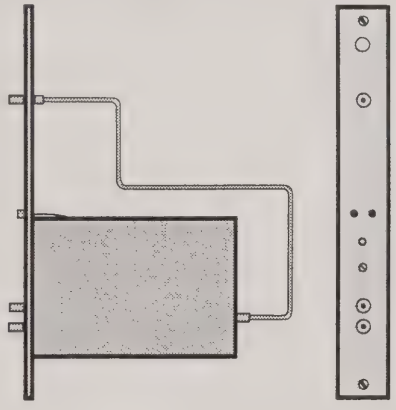


- Adding the appropriate options to previously selected submodules, TSP-5 format unit are obtained. These units are plugable to normalized 19" rack cabinets through an adapting frame.

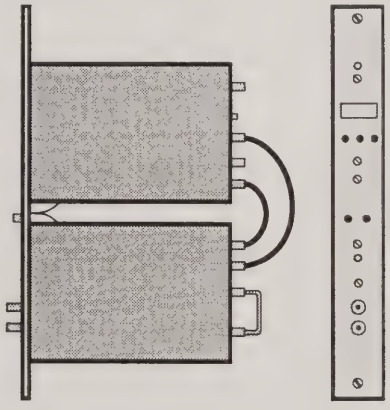
VERTICAL FORMAT FOR TSP-5 MODULES

The pictures show examples for simple and double assembly for comple-mentary subsystems (i.e.: receiver and modulator).

Certain redundant assemblies are also feasable (i.e.: double modulator).



Single assembly OMS-105



Double assembly OMD-205

Fig. 5

VERTICAL MOUNTING OPTION		OMS-105	OMD-205
Ref.		**3604**	**3606**
Submodules per assembly		One	Two [1]
Size (h x w x d)	mm	40 x 360 x 230	
Packed maximum weight	g	600	

[1] Ask for feasibility when submodules are not complementaries.

TSP-5 VERTICAL SERIES - SPECIFIC ACCESSORIES

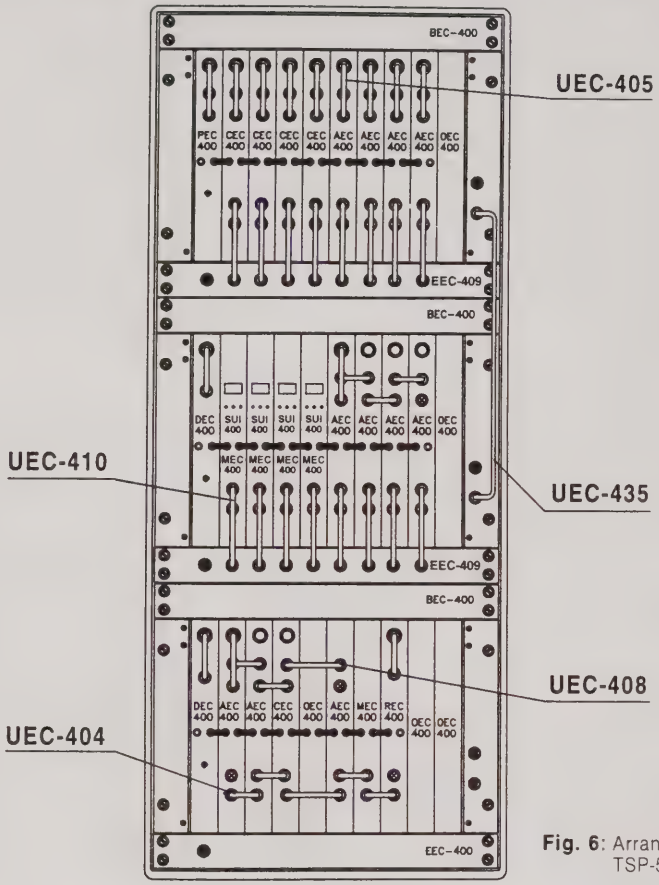


Fig. 6: Arrangement of the interconnecting plug-bridges in a TSP-5 headend.

F TYPE RF INTERCONNECTING PLUG BRIDGES	(See below)
Of predetermined lengths, they make connections among different elements in the TSP-5 series, easy and fast. See picture above.	

Model	UEC-405	UEC-410	UEC-404	UEC-408	UEC-435
Ref.	2610	2611	2597	2598	2599
Usage	Connection of antenna inputs to the vertical modules	Connection of modules outputs to EEC-409 multiplexor	Z connection of adjacent modules	Z connection of alternative modules (separated 1 module)	Connection of 2 V modules in adjacent frames
Length	71 mm	105 mm	40 mm	80 mm	355 mm

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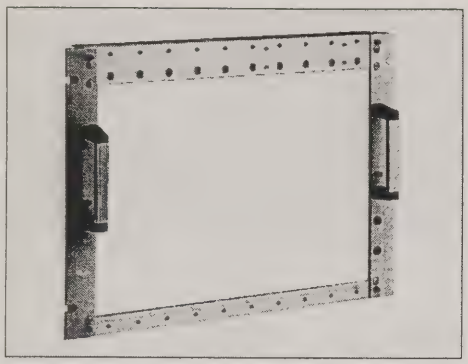
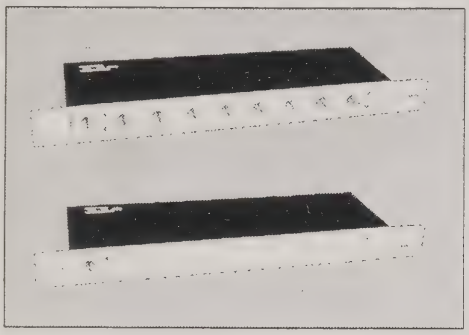
TSP-5 VERTICAL SERIES - SPECIFIC ACCESSORIES



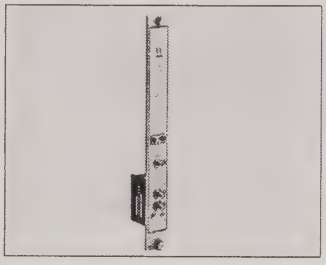
RACK FRAME 19"	MAC-419 Ref. 2603

Aluminium frame for fastening TSP-5 vertical modules in a 19" rack.

- Capacity: 10 modules.
- 12 holes for RF connectors.
- Size: 19" x 8 u (483 x 355 mm). Packed weight: 850 g.

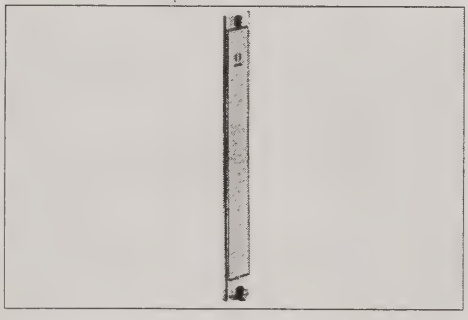


OUTPUT MULTIPLEXERS	EEC-409	EEC-400
Ref.	3738	2592
Number of inputs	8 + 1 ext.	8
For more information see page	2I.1	2I.2



2 AND 4 INPUTS VERTICAL MULTIPLEXER	JEC-400 Ref. 2596

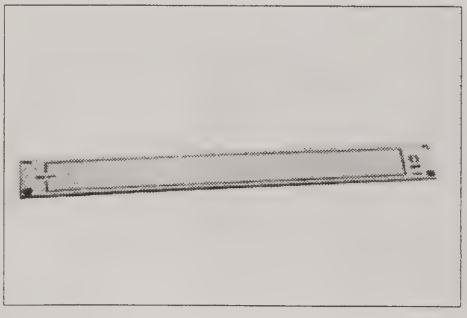
Used for "Z" and aperiodic assemblies. It is advisable for adjacent channel performance or when the number of channels is high in "Z" technique stations. Doing two series of channels, in "Z", (pairs and impairs) and afterwards adding them is convenient. Packed weight: 820 g.



1 VERTICAL MODULE BLANK FRONT PANEL	OEC-400 Ref. 2604

With the same frontal size as a TSP-5, it is used to cover vertical gaps of non mounted elements. It is fastened to a 19" rack frame.

- Dimensions: 355 x 40 mm. Packed weight: 330 g.



1u HORIZONTAL BLANK FRONT PANEL	BEC-400 Ref. 2605

- Used to cover front blanks in a 19" rack cabinet. Fastening screws are included.
- Dimensions: 19" x 1u (483 x 44.5 mm). Packed weight: 200 g.

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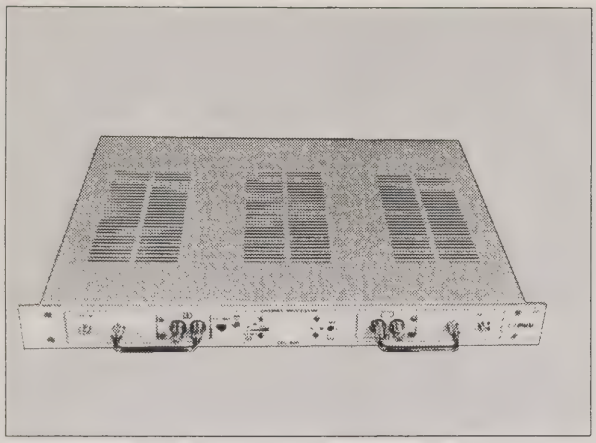
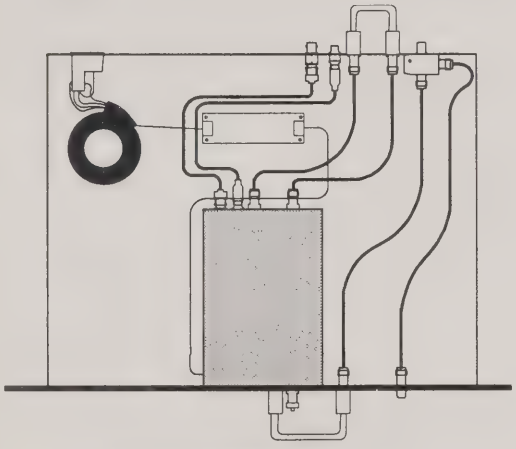
TSP-19 HORIZONTAL SERIES - OPTIONS



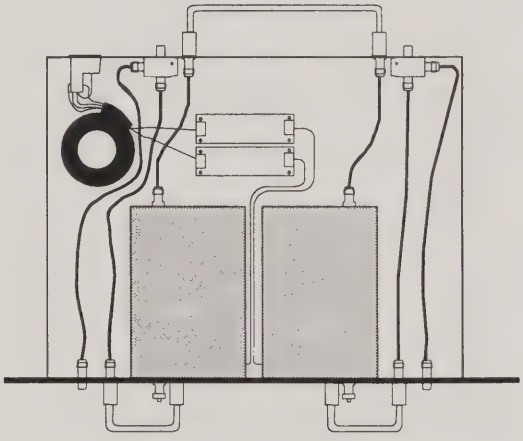
- Adding the appropriate options to previously selected submodules, TSP-19 format unit are obtained. These units are directly plugable to normalized 19" racks.

HORIZONTAL FORMAT OF TSP-19 SERIES

The picture shows an example of how modules are laid out in a 19"/1u rack unit, together with the built-in power supply, accessories and cabling.



Single assembly OMS-119



Double assembly OMD-219

Fig. 7

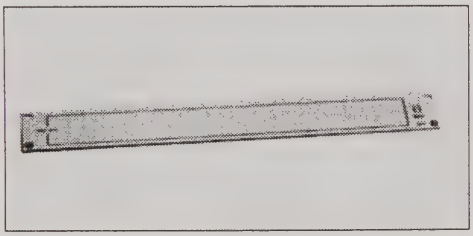
Complementary modules (i.e.: satellite receiver and modutator), are usually assembled in a single rack, leaving their own interconnections at the rear panel accesible. When two similar modules are mounted in the same unit (2 modulators, for example), for redundance purposes, the Double Assembly option must be considered.

HORIZONTAL MOUNTING OPTION		OMS-119	OMD-219
Ref.		**3600**	**3602**
Modules per assembly		One	Two
Mains voltage	**VAC**	110 / 120 / 220 / 240	
Packed size	**mm**	600 x 425 x 75	
Maximum packed weight	**kg**	5	

TSP-19 HORIZONTAL SERIES - SPECIFIC ACCESSORIES

LNBs FEEDING OPTION		OLN-018
Ref.		**3612**
Made from regulated shortcircuitable power supply and a RF-DC diplexer switchable at the rear panel. Factory mounted.		
DC output voltage	**V**	18
Maximum current	**mA**	500
Weight	**g**	50

PATCH-CORD		COR-220
Ref.		**3616**
1.5 m in length. For Schuko type socket.		
Packed weight	**g**	170



1u HORIZONTAL BLANK FRONT PANEL	BEC-400 Ref. 2605
• Used to cover front blanks in a 19" rack cabinet. Fastening screws are included. • Dimensions: 19" x 1u (483 x 44.5 mm). Packed weight: 200 g.	

POWER CONSUMPTION

It is variable, depending on the chosen type of functions. As far as all subsystems are feeded at +12 V_{DC}, an easy way to calculate power consumption is the following one:

1) Add consumption, in mA, of every subsystem (C).
2) Use $W = K \times C$ formula

where:

C= Current consumption at +12 V, obtained from technical data.

K= .021 (A constant which take into account the efficiency of the power supplies).

W (result) = Power consumption in VA

As consequence of their heat dissipation, special care must be taken to how the modules are laid and ventilated when setting in a normalized 19" rack.

908024

CATV AMPLIFIERS

IKUSI

908024

CATV AMPLIFIERS

IKUSI AMPLIFIERS FOR CATV SYSTEMS

IKUSI offers a wide range of CATV amplifiers that meet the different categories of CATV systems that can be established in terms of its upper frequency (or, in other words, its TV-channel capacity) and its use (only forward-way or two-way). They are grouped in two series —«TAL» and «TAE»— whose main features are shown in the "Selection guide" table on next page. The «TAL» series amplifiers are dedicated to either trunk and distribution lines meanwhile those of the «TAE» series are used basically as extender amplifiers.

AMPLIFICATION TECHNOLOGIES

The IKUSI CATV amplifiers use two advanced technologies in the forward amplification: Push-pull and Power Doubling. The first one reduces harmonic distortion significantly and thus can simultaneously amplify a larger number of signals than can one single-ended transistor stage. The Power Doubling technology, which may be described in a simplified way as two Push-pull circuits connected in parallel, provides high output capability; this means, in CATV networks, longer spans, fewer amplifiers and, really, lower installation and maintenance costs.

AUTOMATIC LEVEL AND SLOPE CONTROL

Changes in attenuation characteristics of cable over temperature must be compensated in order to ensure predicted system performance. It is necessary to have a control circuit to provide automatic change in the gain and slope of the amplifier to maintain its working signal level. This automatic level and slope control (ALSC) is available in the IKUSI amplifiers for the forward way and is achieved by monitoring either pilot carriers or selected TV-carriers on the system and compensating for changes in carriers with changes in amplifier gain.

«TAL» SERIES - GENERAL FEATURES

- Forward way output configuration (1 or 2 ports) and active or passive return path through plug-in units.
- Local and remote powering.
- Switch-mode power supply with automatic transient protection, output overvoltage protection and current limiting.
- Transient protected connection ports.
- Input and output RF connections by 5/8"-24 UNEF 2A pin connectors.
- External 75 ohms test points on "F" type connectors.
- Aluminium (UNE L-2630 / SAE-306) die-cast housing with exceptionally fine cooling characteristics. Weatherproofing IP67 grade and maximum RFI shielding. Stainless steel screws.
- Wall-fixing. Pole— or strand wire—fixing by appropriate accessories.
- Earthing and sealing facilities.
- **CE** certificate.

«TAE-900» SERIES - GENERAL FEATURES

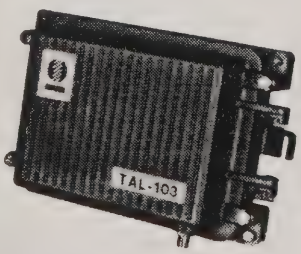
- Passive return path.
- Local and remote powering.
- Switch-mode power supply with automatic transient protection, output overvoltage protection and current limiting.
- Transient protected connection ports.
- "F" type connectors.
- External 75 ohms test points.
- Zinc alloy (UNE 1743) housing with exceptionally fine cooling characteristics. Weatherproofing IP55 grade and maximun RFI shielding.
- Wall fixing.
- Earthing facilities.
- **CE** certificate.

«TAE-700» SERIES - GENERAL FEATURES

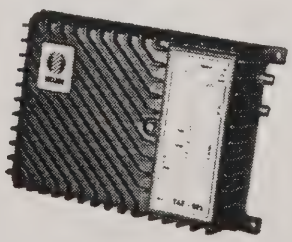
- Passive return path.
- Local powering.
- Transient protected connection ports.
- "F" type connectors.
- External 75 ohms test points.
- Zinc alloy (UNE 1743) housing with exceptionally fine cooling characteristics and maximun RFI shielding.
- Indoor mounting. Wall fixing.
- Earthing facilities.
- **CE** certificate.

«TAE-100» SERIES - GENERAL FEATURES

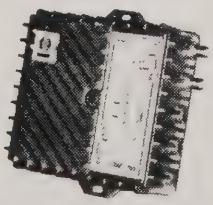
- Passive return path.
- Local powering.
- "F" type connectors.
- Zinc alloy (UNE 1743) housing. Maximum RFI shielding.
- Indoor mounting. Wall fixing.
- **CE** certificate.



«TAL-100, -200, -800»



«TAE-900»



«TAE-700»

«TAE-100»

CATV AMPLIFIERS

SELECTION GUIDE

Upper frequency	Series	Forward way (FW) MHz	Reverse way (RW) MHz	Amplification technology	FW output level dBµV	RW output level dBµV	ALSC capable
862 MHz	«TAL-800»	47-862 86-862	5-30 5-55	Power Doubling (Push-pull)*	121 (1) 115 (2) 119 (1) 112 (2)	118 (1) 108 (2)	Yes (pilot carriers)
	«TAL-200»	47-862 86-862	5-30 5-55	Power Doubling Push-pull	121 (1) 115 (2) 119 (1) 112 (2)	118 (1) 108 (2)	NO
	«TAE-900»	47-862 86-862	5-30 5-55	Push-pull	120 (1) 115 (2)	(Passive)	NO
	«TAE-700»	47-862 53-862 86-862	5-30 5-42 5-66	Push-pull	118 (1) 115 (2)	(Passive)	NO
	«TAE-100»	47-862 86-862	5-30 5-55	Push-pull	(2x) 108 (1) (2x) 97 (2)	(Passive)	NO
750 MHz	«TAE-900»	47-750 86-750	5-30 5-55	Push-pull	120 (1) 115 (2)	(Passive)	NO
	«TAE-700»	47-750 53-750 86-750	5-30 5-42 5-66	Push-pull	118 (1) 115 (2)	(Passive)	NO
606 MHz	«TAL-100»	47-606 86-606	5-30 5-55	Power Doubling Push-pull	122 (1) 116 (2) 120 (1) 113 (2)	118 (1) 108 (2)	Yes (pilot carriers or TV carriers)
	«TAE-900»	47-606 86-606	5-30 5-55	Push-pull	120 (1) 115 (2)	(Passive)	NO
	«TAE-700»	47-606 53-606 86-606	5-30 5-42 5-66	Push-pull	118 (1) 115 (2)	(Passive)	NO
550 MHz	«TAL-100»	47-550 86-550	5-30 5-55	Power Doubling Push-pull	123 (1) 116 (2) 120 (1) 113 (2)	118 (1) 108 (2)	Yes (pilot carriers or TV carriers)
	«TAE-900»	47-550 86-550	5-30 5-55	Push-pull	120 (1) 115 (2)	(Passive)	NO
	«TAE-700»	47-550 53-550 86-550	5-30 5-42 5-66	Push-pull	118 (1) 115 (2)	(Passive)	NO
450 MHz	«TAL-100»	47-450	5-30	Power Doubling Push-pull	126 (1) 116 (2) 120 (1) 113 (2)	118 (1) 108 (2)	Yes (pilot carriers or TV carriers)
	«TAE-900»	47-450	5-30	Push-pull	120 (1) 115 (2)	(Passive)	NO
	«TAE-700»	47-450 53-450	5-30 5-42	Push-pull	118 (1) 115 (2)	(Passive)	NO

(1) -60dB DIN 45004 B
(2) -60dB IMD2

* Being developed.

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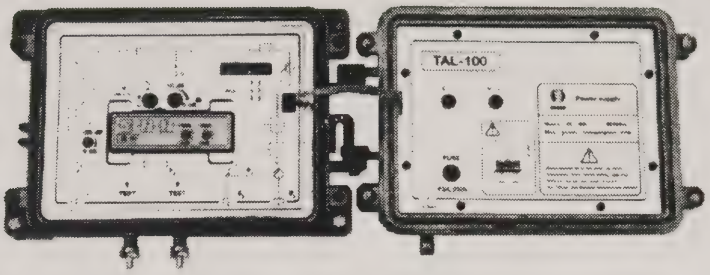
«TAL-100» SERIES CATV AMPLIFIERS



GENERAL DESCRIPTION

CATV amplifiers «TAL-100» series comprises four basic units and an appropriate set of plug-in components that help to configurate trunk and distribution amplifiers which can be adapted to the specific capacity and use of each system as well as for the particular characteristics of the cable network.

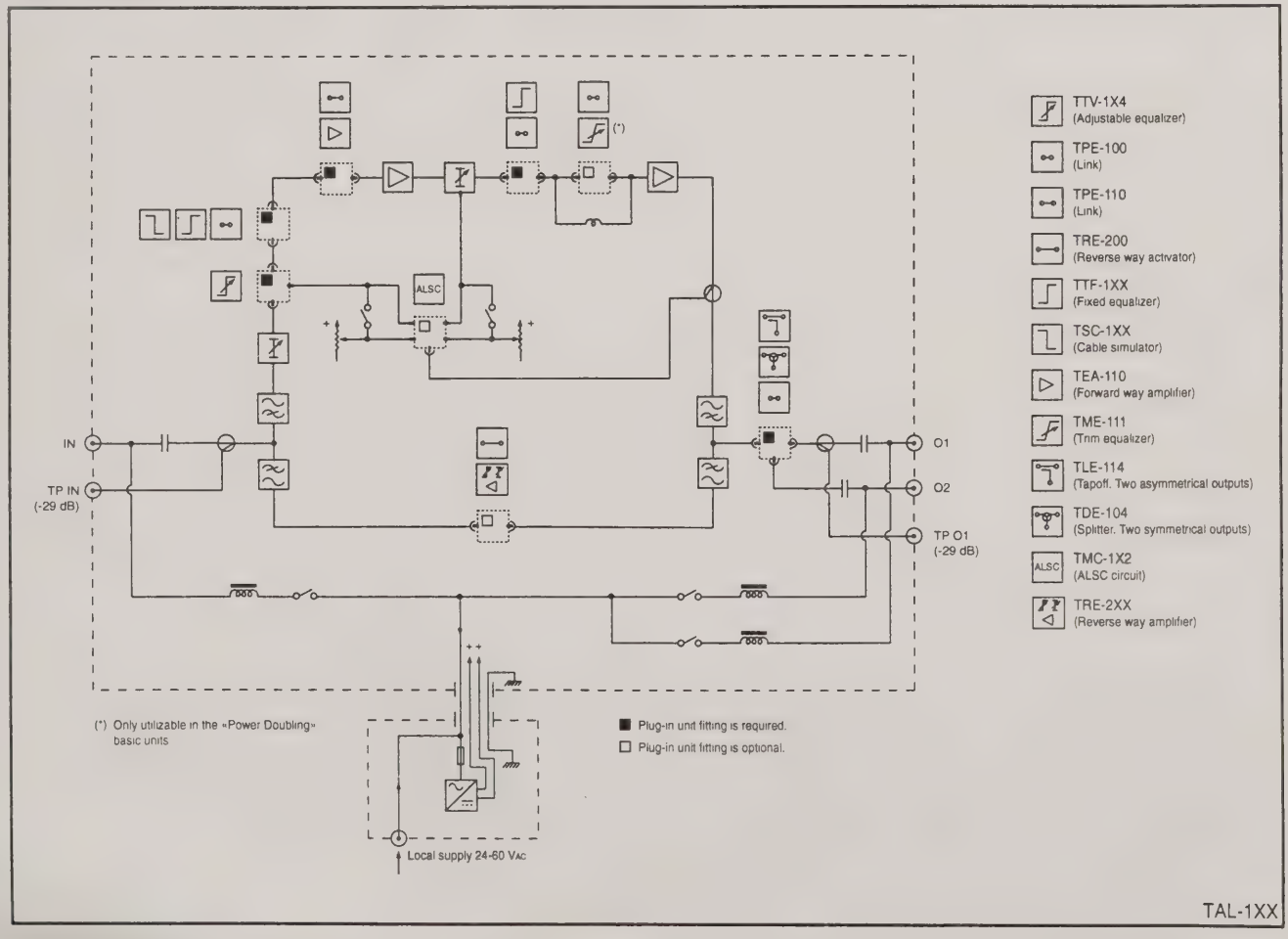
The basic units include the RF amplification, the forward/reverse (FW/RW) diplex filters and a switch-mode power supply from a remote or local 24-60 VAC voltage. Push-pull or Power Doubling technologies and provision for 5-30 or 5-55 MHz return paths are different features that constitute initial choices in the configuration of compact amplifiers which can be upgraded at any time.

An adjustable plug-in module for tilt sets the forward upper frequency: 450, 550 or 606 MHz. Amplification gain can be adjusted with an input attenuator 0-20 dB, with an interstage attenuator 0-10 dB and with a 10 dB amplifier plug-in module. The equipment can be used with sloped frequency response and it can be equipped with additional equalizer or cable simulator, trim equalizer, internal splitter or tap on the output (two symmetrical outputs or two asymmetrical outputs), active or passive return path and an ALSC circuitry that features interstage gain level correction for very low operational noise figure.

An "F" type connector port is the input access for the local powering voltage from an external source.

(SEE «*TAL* SERIES - GENERAL FEATURES» ON PAGE 3A.1)

BLOCK DIAGRAM



TAL-1XX

«TAL-100» SERIES CATV AMPLIFIERS

TECHNICAL DATA

Model			**TAL-103**	**TAL-105**	**TAL-113**	**TAL-115**
Ref.			**2914**	**2915**	**1553**	**1554**
Technology			**Power Doubling**	**Power Doubling**	**Push-pull**	**Push-pull**
Bandwidth — Forward way		**MHz**	**47 — ...** (*)	**86 — ...** (*)	**47 — ...** (*)	**86 — ...** (*)
Bandwidth — Reverse way		**MHz**	**5 — 30**	**5 — 55**	**5 — 30**	**5 — 55**
Forward way (**)	Response flatness (1)	dB	±0.3		±0.5	
	Max gain — configuration: 1 output	dB	25 35 (2)		23 33 (2)	
	Max gain — configuration: 2 symmetrical outputs	dB	(2x) 21.5 (2x) 31.5 (2)		(2x) 19.5 (2x) 29.5 (2)	
	Max gain — configuration: 2 asymmetrical outputs	dB	24 and 13 34 and 23 (2)		22 and 11 32 and 21 (2)	
	Gain drift (-10° to +50° C; 20° C ref.)	dB	±0.6			
	Input attenuator	dB	0 — 20			
	Interstage attenuator	dB	0 — 10			
	Slope control range (3)	dB	0 — 14			
	Output level (- 60dB DIN 45004 B) (4)	dBµV	122 — 126 (5)		120	
	Output level (- 60dB IMD2) (4)	dBµV	116		113	
	CTB distortion (V_o=44 dBmV; 77 channels) (4)	dB	-65		-63	
	CSO distortion (V_o=44 dBmV; 77 channels) (4)	dB	-62		-59	
	Noise figure (max gain)	dB	<7			
	Input/output impedance	Ω	75			
	Input/output return loss @47 MHz.	dB	20 (-1.5 dB/oct.)			
	Output test	dB	-29 ±0.5			
Return way	Response flatness	dB	±0.5			
	Gain (depending on RW activator)	dB	+25 „		+16 „	-2 (passive RW)
	Gain drift (- 20° to +50° C; 20° C ref.)	dB	±0.75 „		±0.5 „	—
	Gain adjustment	dB	≥ 0 — 18			
	Continuous slope control range	dB	14 „		10 „	—
	Output level (- 60dB DIN 45004 B)	dBµV	116 „		118 „	—
	Output level (- 60dB IMD2)	dBµV	104 „		108 „	—
	Noise figure (max gain)	dB	<6.5			
	Input/output return loss	dB	>16			
	Output test	dB	-29 ±0.5			
General	Operating supply voltage (local or remote)	VAC	24 — 60			
	AC requirements	VA	17.5 (6)		13.5 (6)	
	Maximum AC through current	A	7			
	Hum modulation, @7A	dB	< -76			
	Screening factor	dB	>80			
	Operating temperature range	°C	-20 ... +55			
	Outside dimensions	mm	210 x 148 x 100			
	Packed weight	kg	2.100			

(*) Upper frequency: 606, 550 or 450 MHz, set by the required plug-in *TTV-1X4* adjustable equalizer.

(**) The specific characteristics arised from the insertion of a *TMC-1X2* ALSC circuit are shown in page 3B.5.

(1) With the *TPE-100* and *TPE-110* plug-in links installed in the input and interstage circuits.

(2) With the *TEA-110* forward amplifier installed.

(3) With the required plug-in *TTV-1X4* adjustable equalizer. Range can be enlarged with an additional *TTF-1XX* fixed equalizer or *TSC-1XX* cable simulator.

(4) Without preemphasis. *TPE-100* plug-in link installed in the interstage circuit.

(5) 122 dBµV (upper frequency 606 MHz); 123 dBµV (550 MHz); 126 dBµV (450 MHz).

(6) Add up 1.6 VA if a RW amplifier is installed. Idem 0.7 VA, if a FW amplifier. Idem 1.2 VA, if an ALSC circuit.

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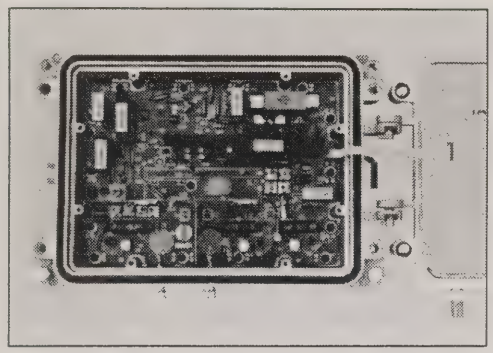
«TAL-100» - PLUG-IN UNITS



Whether active or passive, the plug-in units make operative the *TAL-1XX* basic amplifiers, these becoming trunk and distribution compact CATV amplifiers. They are presented as light plastic boxes provided with a guide that facilitates their insertion.

RF links		TPE-100	TPE-110
Ref.		1551	1552
Installation		- In the FW input circuit, when neither fixed equalizer nor cable simulator are required. - In the interstage circuit, when an output signal preemphasis is not desired. - In the interstage circuit, when a previously installed trim equalizer is removed. - In the output circuit when only one RF output is desired.	- In the FW input circuit, when a higher gain level than that one from the *TAL-1XX* basic amplifiers is not desired.
Bandwidth	MHz	47 - 606	

2-way splitter
Installation in the FW output circuit when 2 symmetrical outputs are desired (use of the equipment as an auxiliary line amplifier).

Model		TDE-104
Ref.		2894
Bandwidth	MHz	5 - 606
Output isolation	dB	> 18

1-way tapoff
Installation in the FW output circuit when 2 asymmetrical outputs are desired (use of the equipment as a line tap-amplifier).

Model		TLE-114
Ref.		2892
Bandwidth	MHz	5 - 606
Output isolation	dB	> 23

TPE-100

TPE-110

TDE-104

TLE-114

«TAL-100» - PLUG-IN UNITS

Adjustable equalizers	(See table)
Installation in the FW input circuit. To compensate for the attenuation depending on the frequency that coaxial cable imposes on the signal. Manual or automatic control by variable voltage.	

Model		TTV-144	TTV-154	TTV-164
Ref.		2911	2910	2909
Tilt articulation point	MHz	450	550	606
Value @47 MHz	dB	0 - 14		

Fixed equalizers	(See table)
- Installation in the FW input circuit when a slope correction greater than that of the adjustable equalizer (14 dB) is required. - Installation in the FW interstage circuit when a wideband output signal preemphasis is desired.	

Model		TTF-146	TTF-142	TTF-156	TTF-152	TTF-166	TTF-162
Ref.		2903	2904	2901	2902	2899	2900
Frequency	MHz	450		550		606	
Value @47 MHz	dB	6	12	6	12	6	12
Insertion loss	dB	≤0.7					
Response flatness	dB	±0.2					

Cable simulators	(See table)
Installation in the FW input circuit. To equalize a preemphasized input signal. (Use more habitual in the first amplifier of a secondary line).	

Model		TSC-107	TSC-114
Ref.		2916	2890
Value @606 MHz	dB	-6	-12
Insertion loss in 47 MHz	dB	≤0.7	
Response flatness	dB	±0.2	

Forward way amplifier	(See table)
Installation in the FW input circuit when a gain level greater than that one from the *TAL-1XX* basic amplifiers is desired.	

Modelo		TEA-110
Ref.		2893
Bandwidth	MHz	47 - 606
Gain	dB	10
Response flatness	dB	±0.3

TTV-1X4

TTF-1XX

TSC-1XX

TEA-110

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«TAL-100» - PLUG-IN UNITS

Trim equalizer (Only in *TAL-103* and *TAL-105* models)

To correct possible signature irregularities along several spans of a cascade.

Model		TME-111
Ref.		2891
Corrigible irregularities (*)		Peak 1 (250 to 300 MHz); Valley 1 (50 to 150 MHz); Valley 2 (200 to 606 MHz)
ΔB of the correction	MHz	Peak 1: 85 - 100; Valley 1: 35 - 100; Valley 2: 60 - 200
Max correction	dB	2
Insertion loss	dB	≤2

(*) Other correction bands on request

Return way activators		TRE-200	TRE-203	TRE-205	TRE-213	TRE-215
Ref.		2956	2957	2958	3913	3914
Type		Passive	Active	Active	Active	Active
Frequency range	MHz	——	5 - 30	5 - 55	5 - 30	5 - 55
Gain	dB	-2	16	16	25	25
Consumption	VA	0	1.6	1.6	1.6	1.6

NOTE: The technical characteristics are indicated in the general technical data on page 3B.2.

Automatic level and slope control circuits (ALSC)

To maintain automatically the level and slope of the forward output signal. Two control voltages operate, respectively, on the input adjustable equalizer and the interstage attenuator.

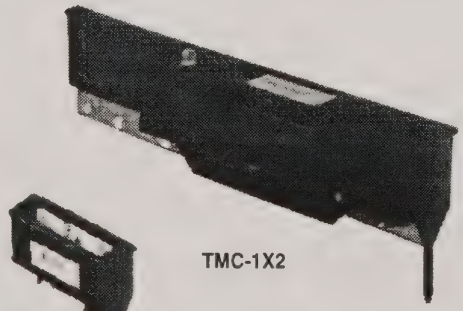
Three possible control signals: a) 2 pilot carriers, upper and lower frequency; b) 2 system selected TV carriers, upper and lower frequency; c) 2 system TV multicarrier groups, upper and lower frequency bands.

Model		TMC-102 (*)	TMC-142
Ref.		2898	2895
Reference signal		2 pilot carriers or 2 TV carriers	System TV multicarriers
Lower carrier frequency between	MHz	47 and 130	—
Upper carrier frequency between	MHz	390 and 606	—
TV multicarrier lower band	MHz	—	47 - 230
TV multicarrier upper band	MHz	—	325 - 606
Output level stability (1)	dB	±0.5	±0.75
Slope and gain control (1)	dB	8	8
Output operating level (1)	dBμV	90 - 100	93 - 105 (2)

(*) The two control reference frequencies -lower and upper- must be indicated.

(1) In a *TAL-1XX* amplifier with a *TMC-1X2* circuit installed.

(2) With 2 TV carriers from each of the low and high forward band shares. The lower and upper output level limits must be reduced in 3 dB every time the TV-carrier number is doubled; 90-102 if there are 4; 87-99 if there are 8; etc.



TMC-1X2

TME-111

TRE-200

TRE-2X3
TRE-2X5

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«TAL-100» - ORDERING INFORMATION

ORDERING INFORMATION

A «TAL-100» CATV amplifier is made up from one basic amplifier and the required (■) or optional (□) plug-in units. The following list helps to accomplish easily the order form proceeding to select only one model in each table:

Basic amplifiers:

Model	Ref.	Technology	Built-in diplex filters
TAL-103	2914	Power Doubling	5-30 MHz 47-606 MHz
TAL-105	2915	Power Doubling	5-55 MHz 86-606 MHz
TAL-113	1553	Push-pull	5-30 MHz 47-606 MHz
TAL-115	1554	Push-pull	5-55 MHz 86-606 MHz

Plug-in units:

ADJUSTABLE EQUALIZER

■

Model	Ref.	Articulation freq.
TTV-144	2911	450 MHz
TTV-154	2910	550 MHz
TTV-164	2909	606 MHz

PRE-EMPHASIZER MODULE OR LINK

■

Model	Ref.	Description
TTF-1XX	XXXX	*Fixed equalizer*
TPE-100	1551	Link

IMPORTANT: If the *TTF-1XX* unit will be installed in an amplifier without ALSC, it must be also considered the *TPE-100* link in the order, since the latter is necessary for the set-up process.

FIXED EQUALIZER OR CABLE SIMULATOR OR LINK

■

Model	Ref.	Description
TTF-146	2903	Fixed equalizer 450 MHz – 6dB
TTF-142	2904	Fixed equalizer 450 MHz – 12dB
TTF-156	2901	Fixed equalizer 550 MHz – 6dB
TTF-152	2902	Fixed equalizer 550 MHz – 12dB
TTF-166	2899	Fixed equalizer 606 MHz – 6dB
TTF-162	2900	Fixed equalizer 606 MHz – 12dB
TSC-107	2916	Cable simulator – 6dB @606 MHz
TSC-114	2890	Cable simulator – 12dB @606 MHz
TPE-100	1551	Link

FW AMPLIFIER OR LINK

■

Model	Ref.	Description
TEA-110	2893	Amplifier
TPE-110	1552	Link

OUTPUT CONFIGURATION MODULE

■

Model	Ref.	Description
TPE-100	1551	Link
TDE-104	2894	2-way splitter
TLE-114	2892	1-way tapoff

TRIM EQUALIZER (*)

□

Model	Ref.	Corrigible irregularities
TME-111	2891	2 valleys and 1 peak

(*) Only usable in the Power Doubling units. If it is removed after installation, a *TPE-100* link must be fitted in its place.

REVERSE WAY ACTIVATOR

□

Model	Ref.	Description
TRE-200	2956	Link
TRE-203	2957	Amplifier 5-30 MHz
TRE-205	2958	Amplifier 5-55 MHz
TRE-213	3913	Amplifier 5-30 MHz
TRE-215	3914	Amplifier 5-55 MHz

ALSC CIRCUIT

□

Model	Ref.	FW upper frequency
TMC-142	2895	450, 550, 606 MHz
TMC-102 (*)	2898	450, 550, 606 MHz

(*) Indicate the two control frequencies. upper and lower.

ORDERING EXAMPLE

An order form example is indicated next for 1 *TAL-103* amplifier up to 550 MHz, with one RF output that will be 6 dB preemphasized. It will be provided with a 16 dB gain return path and an ALSC circuit based on two pilot carriers of 125.75 MHz and 535.25 MHz. It will be installed neither input fixed equalizer nor cable simulator nor forward way amplifier. The order includes a trim equalizer in case of its installation was advisable, as well as an alternating *TPE-100* link just in case the performance of that one was not satisfactory. The amplifier will be remote powered.

(Although they appear in the example, the "Model" and "Description" columns may be removed. Their inclusion is considered convenient to clarify the order).

Item	Ref.	Model	Description	Quantity	Remarks
1	2914	TAL-103	CATV amplifier	1	
	2910	TTV-154	Adjustable equalizer	1	
	1551	TPE-100	Link	3	
	1552	TPE-110	Link	1	
	2901	TTF-156	Fixed equalizer	1	
	2957	TRE-203	RW amplifier	1	
	2898	TMC-102	ALSC circuit	1	125.75 MHz - 535.25 MHz
	2891	TME-111	Trim equalizer	1	

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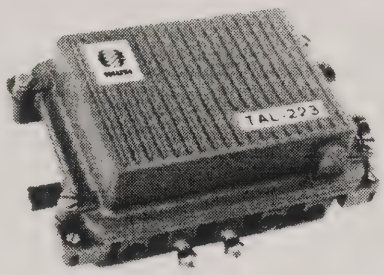
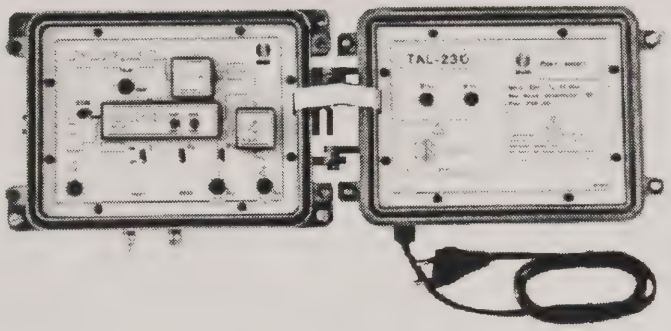
«TAL-200» SERIES CATV AMPLIFIERS





GENERAL DESCRIPTION

CATV amplifiers «TAL-200» series for 862 MHz systems is made up by six basic units and a set of plug-in components that make them wholly operative.

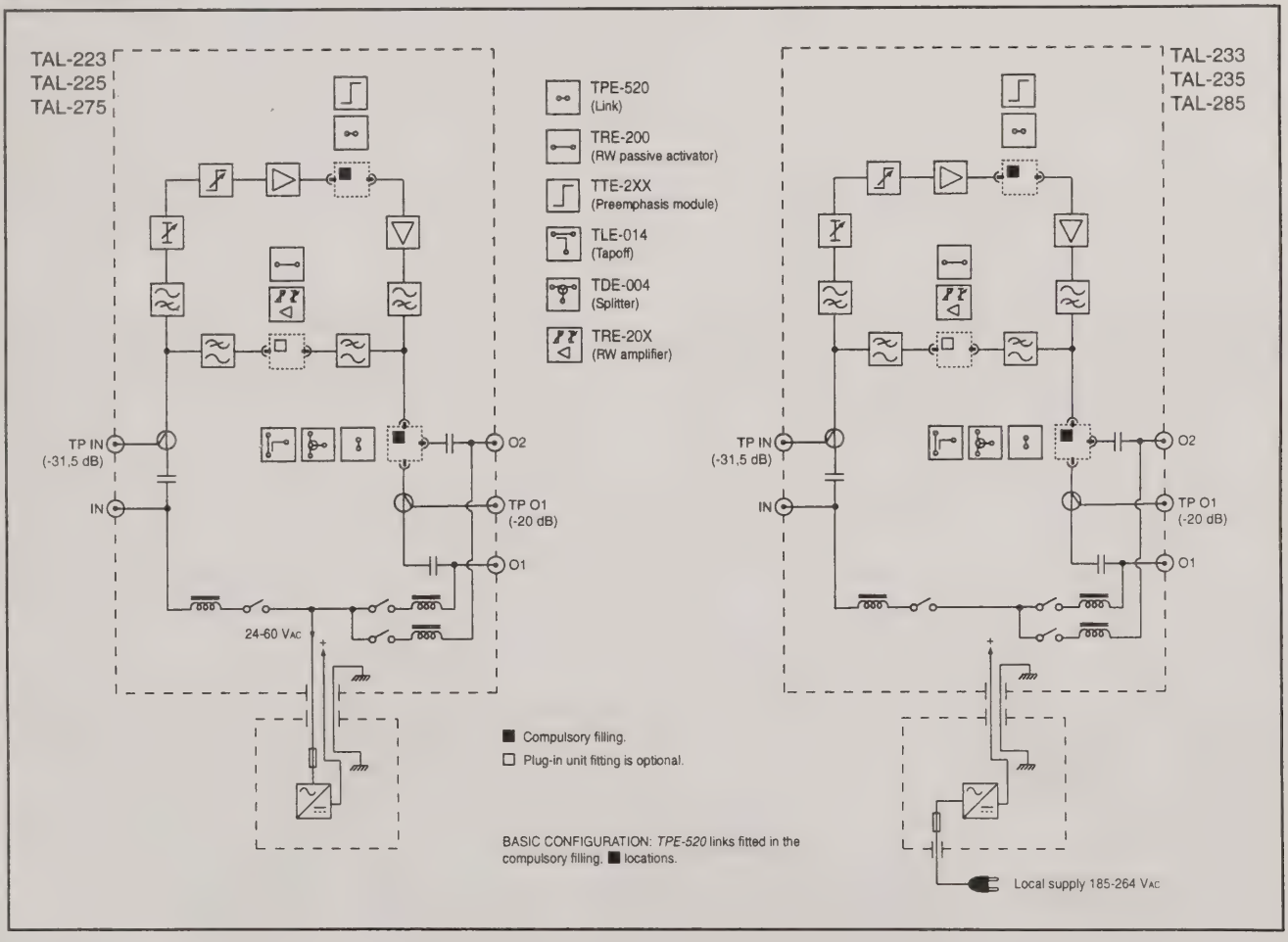
The basic units include the RF amplification, the forward/reverse (FW/RW) diplex filters and a switch-mode power supply. Different technologies –Power Doubling or Push-pull–, different reverse way bands –5-30 or 5-55 MHz– and two powering choices –local (mains) or remote 24-60 VAC– are different features that constitute initial choices in the configuration of compact CATV amplifiers.

The plug-in components make possible a configuration of 1 or 2 outputs (symmetrical or asymmetrical), active or passive return path and a sloped frequency response (6, 12 or 18 dB). Built-in controls allow continuous adjustments for gain and slope.

The locally powered models are provided with cordon/plug assembly for mains connection.

(SEE «*TAL* SERIES - GENERAL FEATURES» ON PAGE 3A.1)

BLOCK DIAGRAMS



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«TAL-200» SERIES CATV AMPLIFIERS

TECHNICAL DATA

Model			**TAL-223**	**TAL-225**	**TAL-233**	**TAL-235**	**TAL-275**	**TAL-285**
Ref.			**2959**	**2961**	**2960**	**2962**	**1556**	**1559**
Technology			**Power Doubling**				**Push-pull**	
Powering mode			**Remote**	**Remote**	**Mains**	**Mains**	**Remote**	**Mains**
Bandwidth — Forward way		**MHz**	**47 — 862**	**86 — 862**	**47 — 862**	**86 — 862**	**86 — 862**	**86 — 862**
Bandwidth — Reverse way		**MHz**	**5 — 30**	**5 — 55**	**5 — 30**	**5 — 55**	**5 — 55**	**5 — 55**
Forward way	Response flatness	dB	±0.5				±0.75	
	Max gain — configuration: 1 output	dB	32				36	
	Max gain — configuration: 2 symmetrical outputs	dB	(2x) 28				(2x) 32	
	Max gain — configuration: 2 asymmetrical outputs	dB	31 and 20				35 and 24	
	Gain drift (-10° to +50° C; 20° C ref.)	dB	±0.6				±1	
	Input attenuator	dB	0 – 20				0 – 15	
	Intrinsic sloped frequency response	dB	1.5				1.5	
	Continuous slope control	dB	0 – 18				0 – 16	
	Output level (-60dB DIN 45004 B)	dBµV	≥121				≥119	
	Output level (-60dB IMD2)	dBµV	≥115				≥112	
	Output level (-60dB CTB, 42 channels, EN 50083-3)	dBµV	≥108				≥105	
	Output level (-60dB CSO, 42 channels, EN 50083-3)	dBµV	≥111				≥108	
	Noise figure (max gain)	dB	<7				<7.5	
	Input/output impedance	Ω	75				75	
	Input/output return loss	dB	>14				>14	
	Output test	dB	-20 ±0.5				-20 ±1	
Reverse way	Response flatness	dB	±0.5					
	Gain (depending on *RW Activator*)	dB	+25	„	+16	„	-2 (passive RW)	
	Gain drift (- 20° to +50° C; 20° C ref.)	dB	±0.75	„	±0.5	„	—	
	Gain adjustment	dB	≥ 0 – 18					
	Continuous slope control range	dB	14	„	10	„	—	
	Output level (-60dB DIN 45004 B)	dBµV	116	„	118	„	—	
	Output level (-60dB IMD2)	dBµV	104	„	108	„	—	
	Noise figure (max gain)	dB	<6.5					
	Input/output return loss	dB	>16					
	Output test	dB	-31.5 ±1					
General	Operating supply voltage	VAC	24 – 60 (remote powering models) / 185 – 264 (mains powering models)					
	Consumption: w/o *RW Amplifier*	VA	16.4 / 18				10 / 11.6	
	Maximum AC through current	A	10					
	Hum modulation, @10A	dB	< -76					
	Screening factor	dB	>80					
	Operating temperature range	°C	-20 ... +50					
	Outside dimensions	mm	210 x 148 x 100					
	Packed weight	kg	2.100					

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«TAL-200» - PLUG-IN UNITS

2-way splitter

Installation in the FW output circuit when 2 symmetrical outputs are desired (use of the equipment as an auxiliary line amplifier).

Model		TDE-004
Ref.		2947
Output isolation	dB	> 20

1-way tapoff

Installation in the FW output circuit when 2 asymmetrical outputs are desired (use of the equipment as a line tap-amplifier).

Model		TLE-014
Ref.		2948
Output isolation	dB	> 26

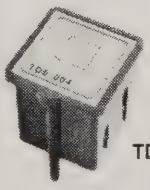
Preemphasis modules

Installation in the FW interstage circuit when a wideband output signal preemphasis is desired.

Model		TTE-206	TTE-212	TTE-218
Ref.		2963	2964	2965
Slope	dB	6	12	18
Insertion loss at 862 MHz	dB	1		
Response flatness	dB	± 0,2		

Return way activators		TRE-200	TRE-203	TRE-205	TRE-213	TRE-215
Ref.		2956	2957	2958	3913	3914
Type		Passive	Active	Active	Active	Active
Frequency range	MHz	——	5 - 30	5 - 55	5 - 30	5 - 55
Gain	dB	-2	16	16	25	25
Consumption	VA	0	1.6	1.6	1.6	1.6

NOTE: The technical characteristics are indicated in the general technical data on previous page.

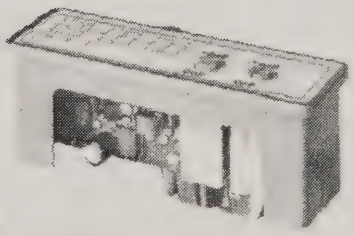


TDE-004

TLE-014

TTE-2XX

TRE-200



TRE-2X3 / TRE-2X5

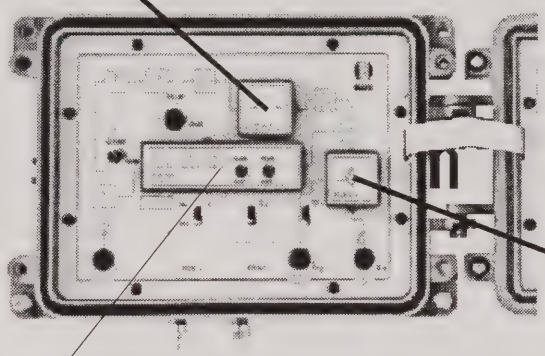
«TAL-200» - ORDERING INFORMATION

CONFIGURATING THE AMPLIFIERS

The figure shows the locations of the plug-in units in a «TAL-200» amplifier and its relation with the different RF configuration options. The heavy line marked locations must be occupied, so the *TPE-520* links originally fitted must be kept if the corresponding options are not used. That one marked with thin line may remain empty if the corresponding option is not used.

PREEMPHASIS

- Link TPE-520, originally fitted.
- Preemphasis module TTE-2XX



OUTPUT CONFIGURATION

- Link TPE-520, originally fitted.
- 2-way splitter TDE-004
- 1-way tapoff TLE-014

RETURN WAY ACTIVATOR

- Passive: Activator TRE-200
- Active: Activator TRE-2XX

ORDERING EXAMPLE

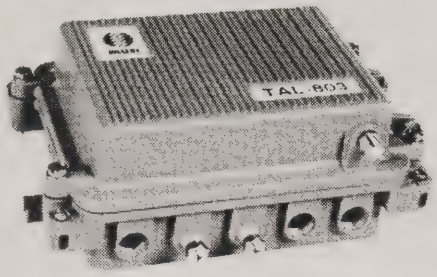
As indicated above, each «TAL-200» amplifier is supplied in a basic configuration that includes 2 *TEP-520* links installed in the compulsory filling locations. To make use of the configuration options shown there, the order must include the appropriate plug-in elements that, as befitting, will replace the mentioned links.

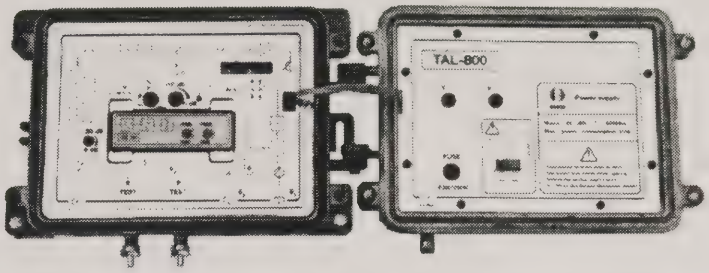
An order form example is indicated next for 1 *TAL-225* amplifier to be installed as tap-amplifier in a trunk line. A 6 dB preemphasized response is desired as well as a 16 dB active return path.

(Although they appear in the example, the «Model» and «Description» columns may be removed. Their inclusion is considered convenient to clarify the order).

Item	Ref.	Model	Description	Quantity	Remarks
1	2961	TAL-225	CATV amplifier	1	
	2948	TLE-014	Tapoff	1	
	2963	TTE-206	Preemphasis module	1	
	2958	TRE-205	RW amplifier	1	

«TAL-800» CATV SERIES AMPLIFIERS





GENERAL DESCRIPTION

CATV trunk and distribution amplifiers «TAL-800» series for 862 MHz systems comprises four basic units and an appropriate set of plug-in components that make them wholly operative.

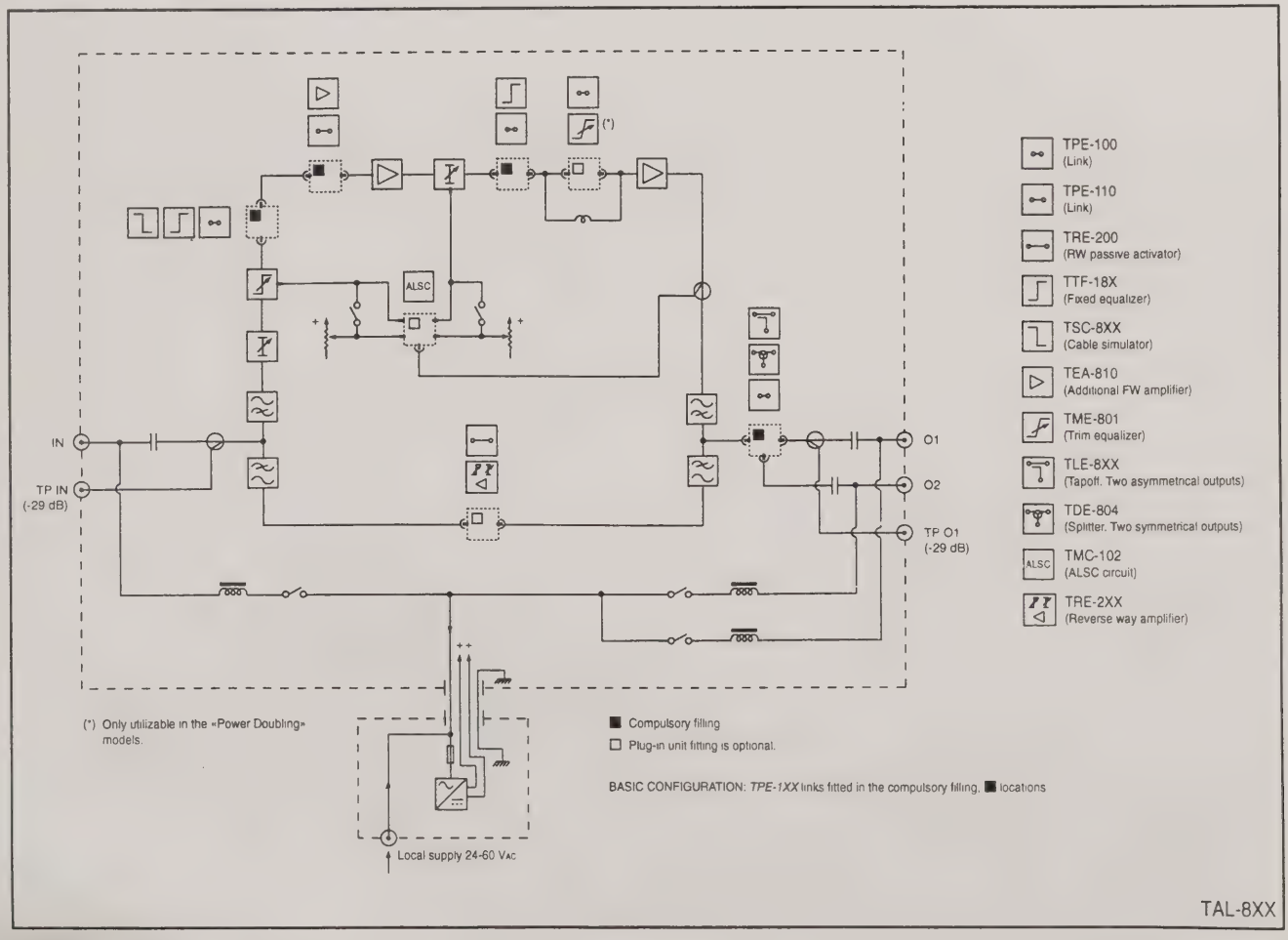
The basic units include the RF amplification, the forward/reverse (FW/RW) diplex filters and a switch-mode power supply from a remote or local 24-60 Vac voltage. Push-pull or Power Doubling technologies and provision for 5-30 or 5-55 MHz return paths are different features that constitute initial choices in the configuration of compact amplifiers especially adapted for the particular characteristics of the cable network.

A built-in adjustable equalizer provides 18 dB continuous slope setting. Amplification gain can be adjusted with an input attenuator 0-18 dB, with an interstage attenuator 0-10 dB and with an amplifier 10 dB plug-in module. The equipment can be used with sloped frequency response and it can be equipped with additional equalizer or cable simulator, trim equalizer, internal splitter or tap on the output (two symmetrical outputs or two asymmetrical outputs), active or passive return path and a ALSC circuitry that features interstage gain for very low operational noise figure.

An "F" type connector port is the input access for the local powering voltage from an external source.

(SEE «*TAL* SERIES - GENERAL FEATURES» ON PAGE 3A.1)

BLOCK DIAGRAM



(*) Only utilizable in the «Power Doubling» models.

■ Compulsory filling
□ Plug-in unit fitting is optional.

BASIC CONFIGURATION: *TPE-1XX* links fitted in the compulsory filling ■ locations

TAL-8XX

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«TAL-800» SERIES CATV AMPLIFIERS

TECHNICAL DATA

				TAL-803	TAL-805	TAL-813	TAL-815
Model							
Ref.				3904	3905	3906	3907
Technology				Power Doubling	Power Doubling	Push-pull	Push-pull
Bandwidth — Forward way			MHz	47 – 862	86 – 862	47 – 862	86 – 862
Bandwidth — Reverse way			MHz	5 – 30	5 – 55	5 – 30	5 – 55
Forward way	Response flatness	Basic configuration	dB	±0.4		±0.5	
		With additional amplif.		±0.8		±0.8	
	Gain @862 MHz # 1 RF output #	Basic configuration	dB	25		22	
		With additional amplif.		35		32	
	Gain @862 MHz # 2 RF symmetrical outputs #	Basic configuration	dB	(2x) 21		(2x) 19	
		With additional amplif.		(2x) 31		(2x) 29	
	Gain @862 MHz # 2 RF asymmetrical outputs # (4 tap levels)	Basic configuration	dB	23 and 17 / 24 and 13 / 24 and 8 / 24 and 2		20 and 14 / 21 and 10 / 21 and 5 / 21 and -1	
		With additional amplif.		33 and 27 / 34 and 23 / 34 and 18 / 34 and 12		30 and 24 / 31 and 20 / 31 and 15 / 31 and 9	
	Gain drift (-20° to +50° C; 20° C ref.)		dB	±0.6		±0.8	
	Input attenuator		dB	≥ 0 – 18		≥ 0 – 18	
	Interstage attenuator		dB	0 – 10		0 – 10	
	Intrinsic sloped frequency response		dB	≤3		≤2	
	Continuous slope control		dB	18		18	
	Additional slope fixed correction		dB	-7 „ -15 „ +6 „ +12		-7 „ -15 „ +6 „ +12	
	Output level (- 60dB DIN 45004 B)		dBµV	≥121		≥119	
	Output level (- 60dB IMD2)		dBµV	≥115		≥112	
	Output level (- 60dB CTB, 42 channels, EN 50083-3)		dBµV	≥108		≥104	
	Output level (- 60dB CSO, 42 channels, EN 50083-3)		dBµV	≥111		≥107	
	Noise figure	Basic configuration	dB	7 (450 MHz) „ 8.5 (750 MHz) „ 10 (862 MHz)		7 (450 MHz) „ 8.5 (750 MHz) „ 10 (862 MHz)	
		With additional amplifier		6.5 (450 MHz) „ 7 (750 MHz) „ 8 (862 MHz)		6.5 (450 MHz) „ 7 (750 MHz) „ 8 (862 MHz)	
	Input/output impedance		Ω	75		75	
	Input/output return loss @47 MHz		dB	20 (-1.5 dB/oct.)		20 (-1.5 dB/oct.)	
	Output test		dB	-29 ±1		-29 ±1	
	AUTOMATIC LEVEL AND SLOPE CONTROL			The characteristics related with the insertion of an ALSC module are indicated at next page.			
Return way	Response flatness		dB	±0.5			
	Gain (depending on RW activator)		dB	+25 „ +16 „ -2 (passive RW)			
	Gain drift (- 20° a +50° C; 20° C ref.)		dB	±0.75 „ ±0.5 „ —			
	Gain adjustment		dB	≥ 0 – 18			
	Continuous slope control range		dB	14 „ 10 „ —			
	Output level (- 60dB DIN 45004 B)		dBµV	116 „ 118 „ —			
	Output level (- 60dB IMD2)		dBµV	104 „ 108 „ —			
	Noise figure (max gain)		dB	<6.5			
	Input/output return loss		dB	>16			
	Output test		dB	-29 ±0.5			
General	Operating supply voltage (local or remote)		VAC	24 – 60			
	Consumption: basic / max load		VA	17.5 / 21		13.5 / 17	
	Maximum AC through current		A	7			
	Hum modulation, @7A		dB	< -76			
	Screening factor		dB	>80			
	Operating temperature range		°C	-20 ... +55			
	Outside dimensions		mm	210 x 148 x 100			
	Packed weight		kg	2.100			

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«TAL-800» - ACTIVE PLUG-IN UNITS

Additional forward way amplifier

Installation in the FW input circuit when a gain level greater than that one from the *TAL-8XX* basic amplifiers is desired.

Model		TEA-810
Ref.		3922
Bandwidth	MHz	47 - 862
Gain	dB	10
Consumption	VA	0.4

Automatic level and slope control circuit (ALSC)

Control by pilot carriers –upper and lower frequencies– generated at the headend. Two control voltages operate, respectively, on the input adjustable equalizer and the interstage attenuator.

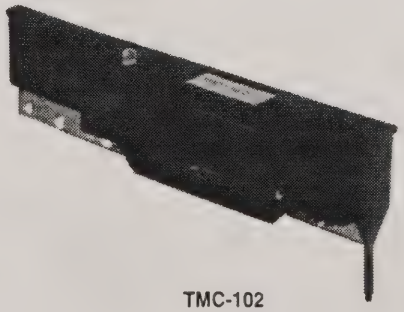
Model		TMC-102 (*)
Ref.		2898
Reference signal		2 pilot carriers or 2 TV carriers
Lower carrier frequency between	MHz	47 - 130
Upper carrier frequency	MHz	between 390 and 606, or 861,75
Output level stability	dB	±0.5
Gain and slope control range	dB	6
Output operating level	dBµV	90 - 100
Consumption	VA	1.2

(*) The two control reference frequencies -lower and upper- must be indicated.

Return way activators		TRE-200	TRE-203	TRE-205	TRE-213	TRE-215
Ref.		2956	2957	2958	3913	3914
Type		Passive	Active	Active	Active	Active
Frequency range	MHz	——	5 - 30	5 - 55	5 - 30	5 - 55
Gain	dB	-2	16	16	25	25
Consumption	VA	0	1.6	1.6	1.6	1.6

NOTE: The technical characteristics are indicated in the general technical data at previous page.

TEA-810



TMC-102

TRE-200

TRE-2X3
TRE-2X5

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«TAL-800» - PASSIVE PLUG-IN UNITS

Fixed equalizers

- Installation in the FW input circuit when a slope correction greater than that of the built-in adjustable equalizer (18 dB) is required.
- Installation in the FW interstage circuit when a wideband output signal preemphasis is desired.

Model		TTF-182	TTF-186
Ref.		3911	3912
Slope (47 - 862 MHz)	dB	12	6
Insertion loss in 862 MHz	dB	≤ 0.7	
Response flatness	dB	± 0.3	

Cable simulators

Installation in the FW input circuit. To equalize a preemphasized input signal. (Use more habitual in the first amplifier of a secondary line).

Model		TSC-807	TSC-814
Ref.		3916	3919
Slope (47 - 862 MHz)	dB	-7	-15
Insertion loss in 47 MHz	dB	≤ 0.7	
Response flatness	dB	± 0.3	

2-way splitter

Installation in the FW output circuit when 2 symmetrical outputs are desired (use of the equipment as an auxiliary line amplifier).

Model		TDE-804
Ref.		3915
Bandwidth	MHz	5 - 862
Insertion loss	dB	4
Output isolation	dB	> 18

1-way tapoffs

Installation in the FW output circuit when 2 asymmetrical outputs are desired (use of the equipment as a line tap-amplifier).

Model		TLE-808	TLE-812	TLE-817	TLE-823
Ref.		3917	3918	3920	3921
Bandwidth	MHz	5 - 862	5 - 862	5 - 862	5 - 862
Through loss	dB	≤ 2	≤ 1	≤ 1	≤ 1
Tap loss	dB	8	12	17	23
Output isolation	dB	> 15	> 20	> 20	> 20

TTF-18X

TSC-8XX

TDE-804

TLE-8XX

TME-801

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«TAL-800» - PLUG-IN TRIM EQUALIZER — RF GRAPHS

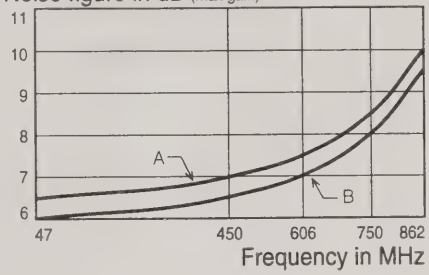
Trim equalizer (Only in *TAL-803* and *TAL-805* models)	Photo at previous page
To correct possible signature irregularities along several spans of a cascade.	

Model		**TME-801**
Ref.		**3120**
Corrigible irregularities		**1 Peak**
ΔB of the correction	**MHz**	**200 - 300**
Max correction	**dB**	**4**
Insertion loss	**dB**	**≤ 2**

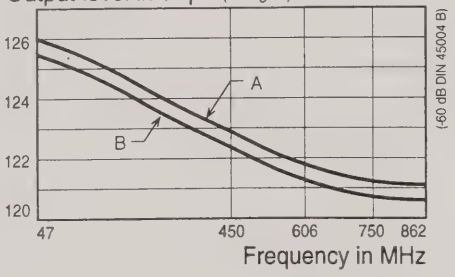
NOISE FIGURE AND RF OUTPUT LEVEL GRAPHS. Typical values.

1. «POWER DOUBLING» models

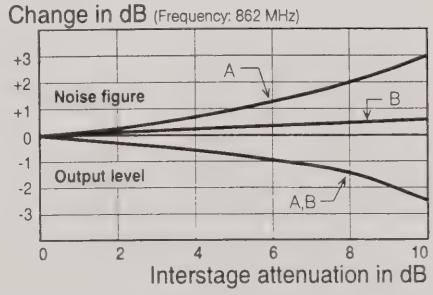
Noise figure in dB (Max gain)



Output level in dBμV (Max gain)

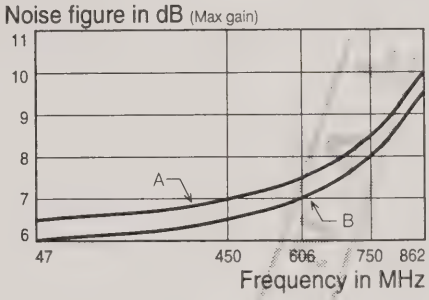


Change in dB (Frequency: 862 MHz)

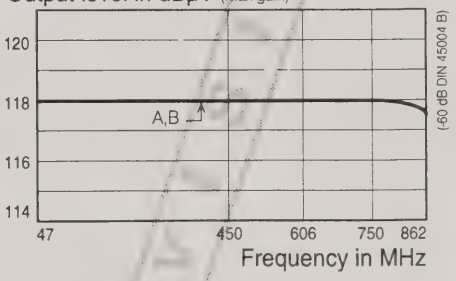


2. «PUSH-PULL» models

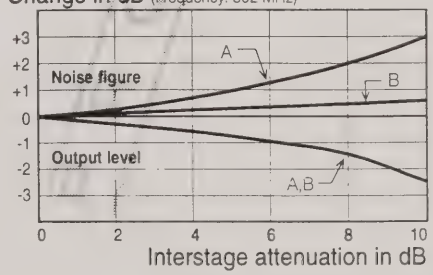
Noise figure in dB (Max gain)



Output level in dBμV (Max gain)



Change in dB (Frequency: 862 MHz)



- Curves "A": basic configuration.
- Curves "B": with additional forward way amplifier.

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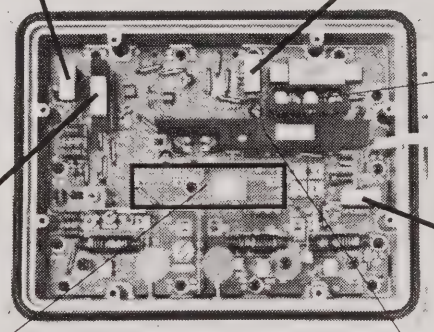
«TAL-800» - ORDERING INFORMATION

CONFIGURATING THE AMPLIFIERS

The figure shows the locations of the plug-in units in a «TAL-800» amplifier and its relation with the different configuration options. The heavy line marked locations must be occupied, so the *TPE-1XX* links originally fitted must be kept if the corresponding options are not used. Those marked with thin line may remain empty if the corresponding options are not used.

ADDITIONAL TILT
- Link TPE-100, originally fitted.
- Fixed equalizer TTF-18X
- Cable simulator TSC-8XX

SLOPED RESPONSE
- Link TPE-100, originally fitted.
- Fixed equalizer TTF-18X



SIGNATURE IRREGULARITIES CORRECTION
- Trim equalizer TME-801.
  (Only usable in the Power Doubling units. If it is removed after installation, a *TPE-100* link supplied with must be fitted in its place).

ADDITIONAL FW AMPLIFIER
- Link TPE-110, originally fitted.
- Additional forward way amplifier TEA-810

OUTPUT CONFIGURATION
- Link TPE-100, originally fitted.
- 2-way splitter TDE-804
- 1-way tapoff TLE-8XX

RETURN WAY ACTIVATION
- Passive: Activator TRE-200
- Active: Activator TRE-2XX

ALSC
- ALSC module TMC-102
  (Indicate the two control frequencies, upper and lower)

ORDERING EXAMPLE

As indicated above, each «TAL-800» amplifier is supplied in a basic configuration that includes four *TPE-1XX* links installed in the compulsory filling locations. To make use of the configuration options shown there, the order must include the appropriate plug-in elements that, as befitting, will replace the mentioned links.

An order form example is indicated next for 1 *TAL-803* amplifier to be installed in a trunk line as auxiliary amplifier (2 outputs). It will be provided with active 16 dB return path and an ALSC circuit controlled by two pilot carriers of 119.25 MHz and 861.75 MHz. A 6 dB sloped response is desired. It will not be installed either input fixed equalizer or cable simulator or additional forward way amplifier.

(Although they appear in the example, the "Model" and "Description" columns may be removed. Their inclusion is considered convenient to clarify the order).

Item	Ref.	Model	Description	Quantity	Remarks
1	3904	TAL-803	CATV amplifier	1	
	3915	TDE-804	2-way splitter	1	
	2898	TMC-102	ALSC circuit	1	119.25 MHz – 861.75 MHz
	3912	TTF-186	Fixed equalizer	1	
	2957	TRE-203	RW activator	1	

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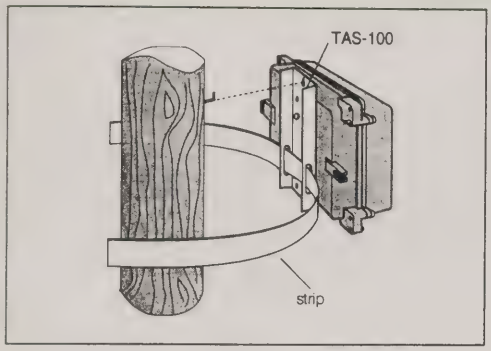
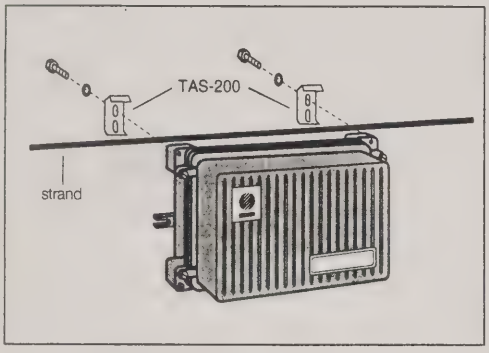
MOUNTING ACCESSORIES - «TAL» SERIES CATV AMPLIFIERS



Póle clamp assembly	TAS-100 Ref. 1546

- Stainless steel clamp-holder for pole-fixing the «TAL» amplifiers, using a max 24 mm wide metal strip.
- Dimensions: 160 x 70 x 20 mm
- Packed weight: 780 g

(Supplied with four M5x12 screws to attach the accessory to the back side of the housing).



Strand clamp assembly	TAS-200 Ref. 1555

- Metallic accessory for suspending the «TAL» amplifiers from a stranded messenger cable. It is constituted by two identical clamp pieces with M6x20 screws for attaching them to the two upper corners of the housing.
- Dimensions: 40 x 23 mm each piece.
- Packed weight: 30 g

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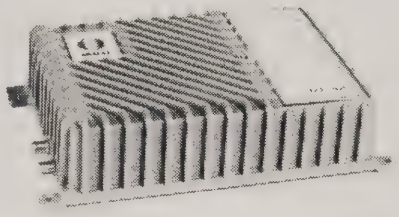
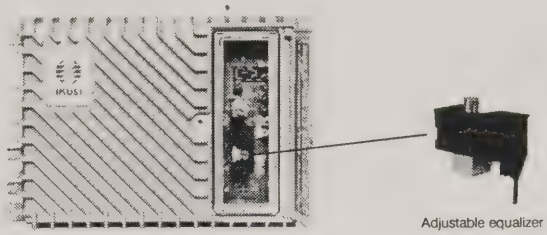
«TAE-900» SERIES CATV AMPLIFIERS





GENERAL DESCRIPTION

«TAE-900» series CATV amplifiers provide gain for feeder extension in systems up to 862 MHz. Their high RF output level –push-pull technology– and the rest of the technical and operative characteristics make them also ready for use as line amplifiers in small CATV networks.

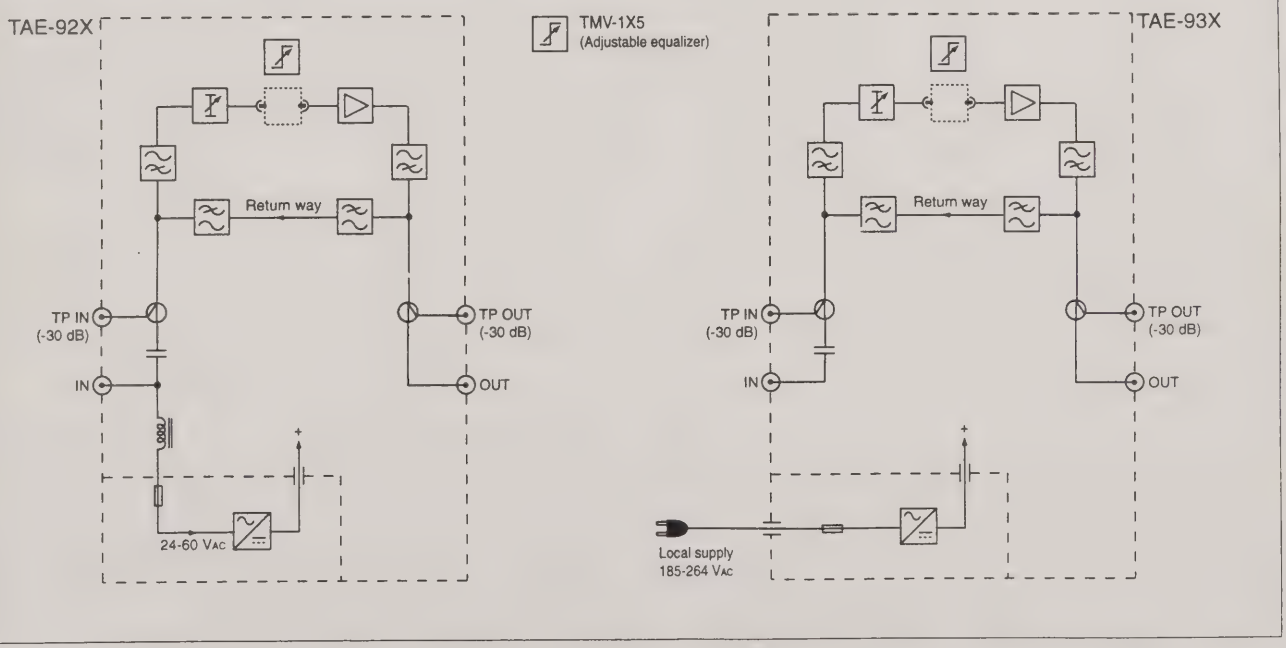
The series offers four basic units with a 862 MHz forward amplification platform, passive return path and a switch-mode power supply. Different features refer to the reverse band –5-30 MHz or 5-55 MHz– and to the powering mode –local (mains) or remote 24-60 VAC via input coaxial cable–.

Five plug-in 0-15 dB adjustable equalizers with tilt articulation points in 450, 550, 606, 750 and 862 MHz complete the series; once inserted into the basic units the latter become line extenders especially adapted for the capacity of the system. A built-in 18 dB continuous adjustment gain control complements the equalizing function for easy set-up.

The locally powered models are provided with cordon/plug assembly for mains connection.

(SEE «*TAE-900* SERIES - GENERAL FEATURES» ON PAGE 3A.1)

BLOCK DIAGRAMS



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«TAE-900» SERIES CATV AMPLIFIERS

TECHNICAL DATA

Model			TAE-923	TAE-925	TAE-933	TAE-935
Ref.			3181	3182	3183	3184
Technology			Push-pull	Push-pull	Push-pull	Push-pull
Powering mode			Remote	Remote	Mains	Mains
Bandwidth — Forward way		MHz	47 — ... (*)	86 — ... (*)	47 — ... (*)	86 — ... (*)
Bandwidth — Reverse way		MHz	5 — 30	5 — 55	5 — 30	5 — 55
Forward way	Response flatness	dB	±0.75			
	Gain	dB	35 (450 MHz) „ 35.5 (550, 606 MHz) „ 36 (750, 862 MHz)			
	Gain drift (-20° to +50° C; 20° C ref.)	dB	±0.6			
	Gain adjustment	dB	0 - 18			
	Continuous slope control	dB	15			
	Intrinsic sloped response	dB	≤1 (450 MHz) „ ≤1.5 (550, 606 MHz) „ ≤2 (750, 862 MHz)			
	Output level (-60dB DIN 45004 B)	dBµV	≥120			
	Output level (-60dB IMD2)	dBµV	≥115			
	Output level (-60dB CTB, 42 channels, EN 50083-3)	dBµV	≥105			
	Output level (-60dB CSO, 42 channels, EN 50083-3)	dBµV	≥108			
	Noise figure	dB	7			
	Input/output impedance	Ω	75			
	Input/output return loss @47MHz	dB	18 (-1.5 dB/oct.)			
	Output test	dB	-30 ±1			
Return way	Response flatness	dB	±1			
	Through loss	dB	≤2			
	Input/output return loss	dB	≥16			
	Output test	dB	-30 ±0.5			
General	Operating supply voltage	VAC	24 - 60	185 - 264		
	Consumption	VA	8			
	Screening factor	dB	>80			
	Operating temperature range	°C	-20 ... +50			
	RF and Test connector type		"F"			
	Outside dimensions	mm	220 x 150 x 55			
	Packed weight	kg	2.100			

(*) Upper frequency: 862, 750, 606, 550 or 450 MHz, determined by the plugable *TMV-1X5* adjustable equalizer; the technical data table considers this unit as installed.

Adjustable equalizers

Compulsory insertion in the basic units. To compensate for the attenuation depending on the frequency that coaxial cable imposes on the signal.

Model		TMV-145	TMV-155	TMV-165	TMV-175	TMV-185
Ref.		3187	3188	3189	3195	3190
Tilt articulation point	MHz	450	550	606	750	862

ORDERING EXAMPLE

The order form for a «TAE-900» amplifier must include one basic unit and one adjustable equalizer. Example for a remote powered, 5-30 MHz reverse band, 606 MHz amplifier:

Item	Ref.	Model	Description	Quantity	Remarks
1	3181	TAE-923	CATV amplifier	1	
	3189	TMV-165	Adjustable equalizer	1	

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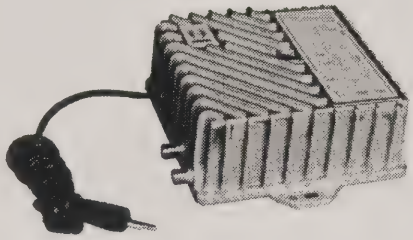
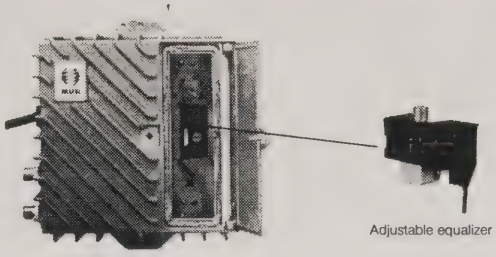
«TAE-700» SERIES CATV AMPLIFIERS





GENERAL DESCRIPTION

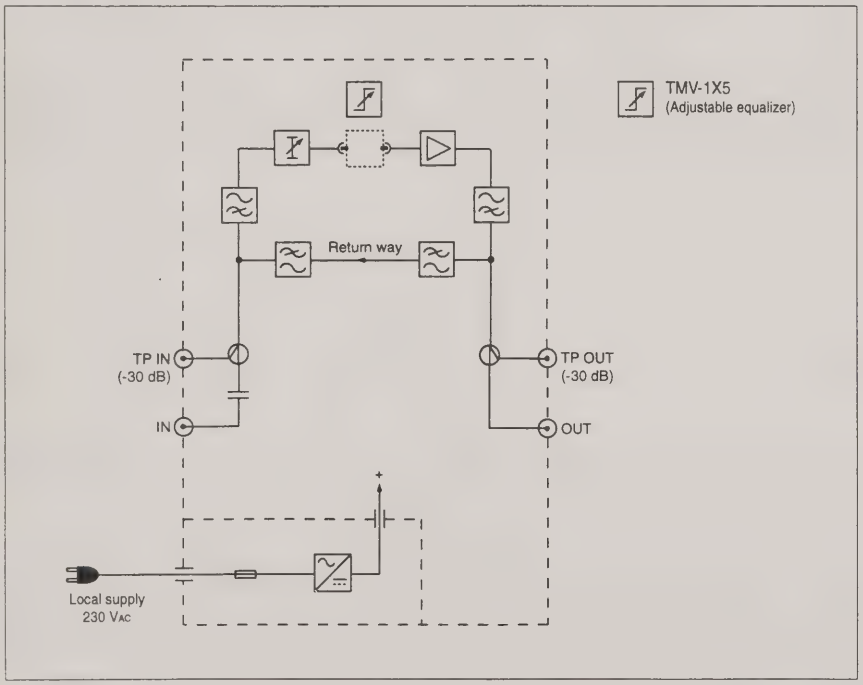
The indoor mounting «TAE-700» Series CATV amplifiers provide gain for feeder extension in systems of up to 862 MHz.

The series includes three mains supplied basic units, all with an 862 MHz forward amplification platform and passive return path; their differentiation is related to the reverse frequency band: 5-30 MHz, 5-42 MHz or 5-66 MHz. Five plug-in 0-15 dB adjustable equalizers with tilt articulation points in 450, 550, 606, 750 and 862 MHz complete the series; once inserted into the basic units, the latter become line extenders especially adapted for the capacity of the system. A built-in 18 dB continuous adjustment gain control complements the equalizing function for easy set-up.

A cordon/plug assembly is provided for the mains connection.

(SEE «*TAE-700* SERIES - GENERAL FEATURES» ON PAGE 3A.1)

BLOCK DIAGRAM



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«TAE-700» SERIES CATV AMPLIFIERS

TECHNICAL DATA

Model			TAE-733	TAE-734	TAE-736
Ref.			3931	3191	3192
Technology			Push-pull	Push-pull	Push-pull
Powering mode			Mains	Mains	Mains
Bandwidth — Forward way		MHz	47 — ... (*)	53 — ... (*)	86 — ... (*)
Bandwidth — Reverse way		MHz	5 — 30	5 — 42	5 — 66
Forward way	Response flatness	dB	±1.5		
	Gain (upper frequency set)	dB	**29** (450 MHz) „ **29.5** (550, 606 MHz) „ **30** (750, 862 MHz)		
	Gain drift (-20° to +50° C; 20° C ref.)	dB	±0.6		
	Gain adjustment	dB	0 - 18		
	Continuous slope control	dB	15		
	Output level (- 60dB DIN 45004 B)	dBµV	≥118		
	Output level (- 60dB IMD2)	dBµV	≥115		
	Output level (-60dB CTB, 42 channels, EN 50083-3)	dBµV	≥103		
	Output level (-60dB CSO, 42 channels, EN 50083-3)	dBµV	≥106		
	Noise figure	dB	7		
	Input/output impedance	Ω	75		
	Input/output return loss	dB	≥14 - 1.5 dB/oct, but ≥10		
	Output test	dB	-30 ±1		
Return way	Response flatness	dB	±1		
	Through loss	dB	≤2		
	Input/output return loss	dB	≥14		
	Output test	dB	-30 ±0.5		
General	Operating supply voltage	V_{AC}	230 (-10%, +6%)		
	Consumption	VA	6		
	Screening factor	dB	>80		
	Operating temperature range	°C	-20 ... +50		
	RF and Test connector type		"F"		
	Outside dimensions	mm	150 x 150 x 55		
	Packed weight	kg	1.100		

(*) Upper frequency: 862, 750, 606, 550 or 450 MHz, determined by the plugable *TMV-1X5* adjustable equalizer; the technical data table considers this unit as installed.

Adjustable equalizers

Compulsory insertion in the basic units. To compensate for the attenuation depending on the frequency that coaxial cable imposes on the signal.

Model		TMV-145	TMV-155	TMV-165	TMV-175	TMV-185
Ref.		3187	3188	3189	3195	3190
Tilt articulation point	MHz	450	550	606	750	862

ORDERING EXAMPLE

The order form for a «TAE-700» amplifier must include one basic unit and one adjustable equalizer. Example for 1 TAE-734 model with forward path up to 862 MHz:

Item	Ref.	Model	Description	Quantity	Remarks
1	3191	TAE-734	CATV amplifier	1	
	3190	TMV-185	Adjustable equalizer	1	

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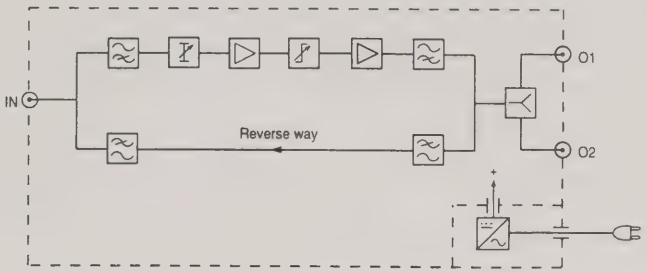
«TAE-100» SERIES CATV AMPLIFIERS



GENERAL DESCRIPTION

«TAE-100» series low noise amplifiers are suitable for applications in any situation where use of splitters produces excess attenuation, as well as in large, single family homes with more sets than the available signal level will accommodate –use as *room amplifiers*–.

The series includes two models differing in the forward way and passive reverse way bandwidths. Both use push-pull technology, they offer two symmetrical RF outputs and they are mains supplied. Built-in controls allow continuous adjustments for gain (10 dB) and slope (6 dB).

(SEE «*TAE-100* SERIES - GENERAL FEATURES» ON PAGE 3A.1)

TECHNICAL DATA

Model			TAE-123	TAE-125
Ref.			2132	2133
Technology			Push-pull	Push-pull
Powering mode			Mains	Mains
Bandwidth - Forward way		MHz	47 — 862	86 — 862
Bandwidth - Reverse way		MHz	5 — 30	5 — 55
Forward way	Response flatness	dB	±1	
	Nominal gain	dB	15.5	
	Gain drift (-20° to +50° C; 20° C ref.)	dB	±1	
	Input attenuator	dB	> 0 - 10	
	Continuous slope control	dB	>6	
	Output level (-60 dB DIN 45004 B)	dBµV	(2x) 108	
	Output level (-60 dB IMD2)	dBµV	(2x) 97	
	Noise figure	dB	≤4.5 (f ≤300 MHz) „ ≤5.5 (f >300 MHz)	
	Input impedance	Ω	75	
	Output impedance	Ω	(2x) 75	
	Input/output return loss @47 MHz	dB	≥16 (-1.5 dB/oct.)	
	Output isolation @47 MHz	dB	≥18 (-1.5 dB/oct.)	
Reverse way	Response flatness	dB	±0.5	
	Thru loss	dB	4	
	Input/output return loss	dB	≥16	
General	Mains supply	VAC	230 (±15%)	
	Consumption	VA	4	
	Screening factor	dB	>80	
	Operating temperature range	°C	-10 ... +50	
	RF connector type		"F"	
	Dimensions	mm	122 x 80 x 48	
	Packed weight	g	450	

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DISTRIBUTION AND SUBSCRIBER ELEMENTS

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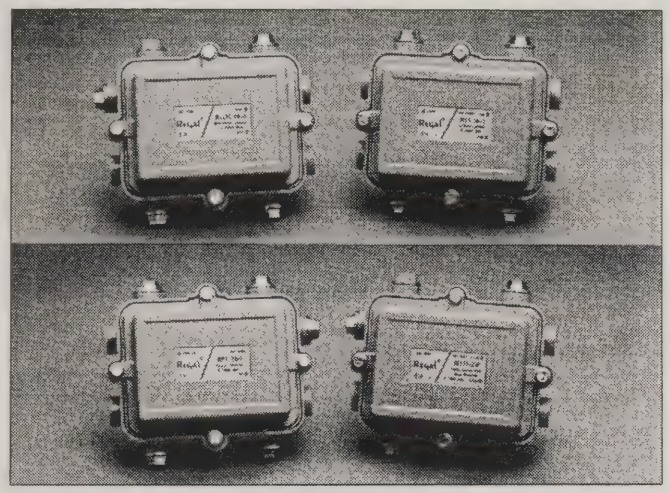
CATV LINE PASSIVES - 1000 MHz



Three directional couplers (8, 12 and 16 dB), one splitter (3-way) and a power inserter are the IKUSI passive elements for trunk line in CATV systems up to 1GHz. They are presented in an aluminium alloy housing with double polyurethane coating to resist corrosion and provided with stainless steel metallic pieces for earthing and mounting –cable, wall or pole-mounting (angle holder *Ref. 2974* required for the two last ones). A woven metallic gasket and a neoprene compression gasket provide exceptional RFI shielding (100 dB minimum) and a weatherproofing IP67 grade.

Circuit board comes mounted on faceplate but may be changed to housing to eliminate outages during diagnostics.

All ports are 5/8"-24 type. The current passing is general and its high capacity is especially useful to simplify the powering and maintenance of the cable network.

DIRECTIONAL COUPLERS

Model			RLDC10-08	RLDC10-12	RLDC10-16
Ref.			2682	2683	2684
Through loss NOMINAL (MAXIMUM)	5 - 50 MHz	dB	1.9 (2.4)	1.3 (1.6)	1.1 (2.2)
	50 - 600 MHz		2.0 (3.2)	1.4 (2.5)	1.2 (2.5)
	600 - 862 MHz		2.6 (3.6)	1.4 (2.8)	1.4 (2.8)
	862 - 1000 MHz		3.4 (4.1)	1.8 (3.5)	1.8 (3.5)
Tap loss (±1 dB)	5 - 50 MHz	dB	8.6	12.2	16.9
	50 - 600 MHz		8.8	12.1	16.8
	600 - 862 MHz		8.2	11.7	16.2
	862 - 1000 MHz		8.3	11.7	15.8
Tap-to-output isolation	5 - 50 MHz	dB	≥28	≥28	≥25
	50 - 600 MHz		≥21	≥23	≥24
	600 - 862 MHz		≥19	≥19	≥19
	862 - 1000 MHz		≥18	≥18	≥18
Return loss		dB	≥15		
Hum modulation (10 A)		dB	≤ -60		
Outside dimensions		mm	135 x 115 x 60		
Packed weight		g	650		

CATV LINE PASSIVES - 1000 MHz

THREE-WAY LINE SPLITTER

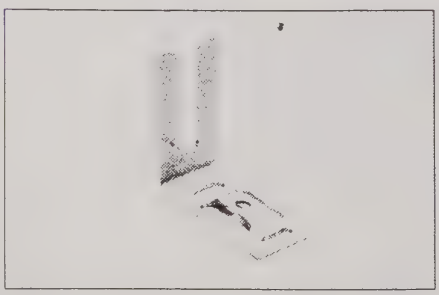
Model			RLS10-3
Ref.			2686
Insertion loss NOMINAL (MAXIMUM)	5 - 50 MHz	dB	**3.7 / 7.1** (4.4 / 8.0) (1)
	50 - 600 MHz		**4.0 / 7.4** (5.4 / 8.7) (1)
	600 - 862 MHz		**4.0 / 7.6** (5.7 / 9.0) (1)
	862 - 1000 MHz		**4.1 / 8.5** (6.0 / 9.2) (1)
Output isolation	5 - 50 MHz	dB	**≥23**
	50 - 600 MHz		**≥20**
	600 - 862 MHz		**≥20**
	862 - 1000 MHz		**≥18**
Return loss		dB	**≥16**
Hum modulation (10 A)		dB	**≤ -60**
Outside dimensions		mm	**135 x 105 x 60**
Packed weight		g	**600**

(1) First values: ports 2, 3. Second values: port 4. (Port 1: input. Ports 2, 3 and 4: outputs).

POWER INSERTER

Model			RPI-100
Ref.			2687
Insertion loss NOMINAL (MAXIMUM)	5 - 50 MHz	dB	**0.5** (1.0)
	50 - 600 MHz		**0.8** (1.2)
	600 - 862 MHz		**0.8** (1.2)
	862 - 1000 MHz		1.0 (1.5)
Return loss		dB	≥16
Max insertion current (1)		A	**12**
Hum modulation (10 A)		dB	< -60
Outside dimensions		mm	**135 x 115 x 60**
Packed weight		g	**650**

(1) Towards both sides.



Angle - holder — **TDE-100 Ref. 2974**

- To fix the CATV passive elements to a wall –with screws– or to a pole –with metal strip–.
- Galvanized steel. Packed weight: 60 g.

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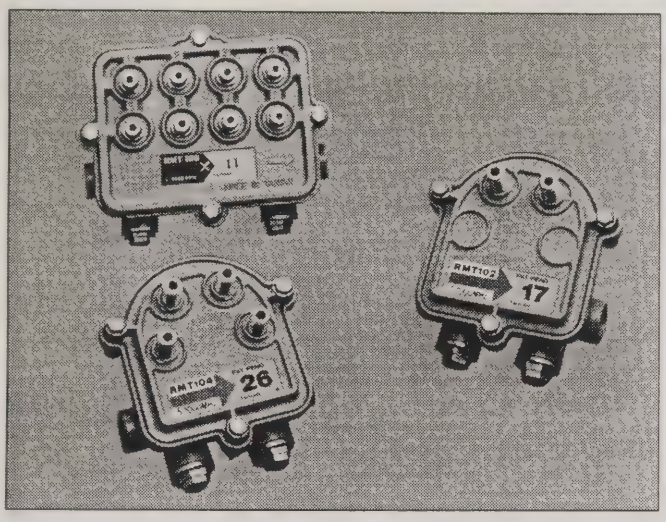
CATV TAP-OFFS - 1000 MHz



The IKUSI tap-offs range for distribution lines in CATV systems up to 1 GHz includes 2- , 4- and 8-port models designed to optimize signal level to the drop. They are presented in an aluminium alloy housing with double polyurethane coating to resist corrosion and provided with stainless steel metallic pieces for earthing and mounting –cable, wall or pole-mounting (angle holder *Ref. 2974* required for the two last ones). A woven metallic gasket and a neoprene compression gasket provide exceptional RFI shielding (100 dB minimum) and a weatherproofing IP67 grade.

Faceplate with circuit board may be taken out without removing coaxial cables, making easy changes or upgrades of the system through single faceplate changeouts.

Line input-output ports are 5/8"-24 type and the tap ports come on neoprene sealed, nickel plated brass "F" connectors.

All units feature input/output power passing (max 6A).

2-PORT TAP-OFFS

Model			RMT102-	4	8	11	14	17	20	23	26	29	32	35
Ref.				2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662
Through loss NOMINAL (MAXIMUM)	5 - 50 MHz	dB	T[1]	3.4 (3.7)	1.5 (1.9)	1.0 (1.4)	0.7 (1.1)	0.4 (0.8)	0.4 (0.8)	0.4 (0.8)	0.4 (0.8)	0.4 (0.8)	0.4 (0.8)	0.4 (0.8)
	50 - 600 MHz		T	4.0 (4.4)	1.9 (2.4)	1.3 (1.8)	0.9 (1.4)	0.8 (1.1)	0.6 (1.1)	0.8 (1.1)	0.7 (1.1)	0.6 (1.1)	0.6 (1.1)	
	600 - 862 MHz		T	4.2 (4.6)	2.2 (3.1)	1.4 (2.3)	1.1 (1.8)	1.1 (1.6)	1.1 (1.6)	1.0 (1.6)	1.1 (1.6)	0.9 (1.6)	0.8 (1.6)	
	862 - 1000 MHz		T	4.4 (4.8)	2.8 (3.7)	2.2 (3.1)	1.4 (2.2)	1.4 (1.7)	1.1 (1.7)	1.2 (1.7)	1.0 (1.7)	1.1 (1.7)	1.0 (1.7)	
Tap loss	5 - 50 MHz	dB		3.4 ± 1.0	7.2 ± 1.0	10.5 ± 1.0	14.6 ± 1.0	16.5 ± 1.0	20.6 ± 1.0	22.5 ± 1.0	25.6 ± 1.0	28.5 ± 1.0	31.6 ± 1.0	34.7 ± 1.0
	50 - 600 MHz			3.5 ± 1.0	7.2 ± 1.0	10.8 ± 1.0	14.4 ± 1.0	16.6 ± 1.0	20.8 ± 1.0	22.6 ± 1.0	25.8 ± 1.0	28.8 ± 1.0	32.1 ± 1.0	35.3 ± 1.0
	600 - 862 MHz			3.7 ± 1.7	7.5 ± 1.7	10.7 ± 1.7	13.5 ± 1.7	16.8 ± 1.7	21.1 ± 1.7	22.9 ± 1.7	26.0 ± 1.7	29.0 ± 1.7	32.5 ± 2.1	35.6 ± 2.1
	862 - 1000 MHz			4.0 ± 2.0	8.6 ± 2.0	11.0 ± 2.0	12.9 ± 2.0	17.0 ± 2.0	21.3 ± 2.0	23.4 ± 2.0	25.5 ± 2.0	28.6 ± 2.0	32.4 ± 2.6	35.4 ± 2.6
Taps-to-output isolation	5 - 50 MHz	dB	T[1]	≥ 18	≥ 18	≥ 20	≥ 30	≥ 30	≥ 35	≥ 38	≥ 40	≥ 42	≥ 45	
	50 - 600 MHz		T	≥ 21	≥ 21	≥ 20	≥ 30	≥ 27	≥ 32	≥ 30	≥ 39	≥ 41	≥ 43	
	600 - 862 MHz		T	≥ 20	≥ 20	≥ 20	≥ 29	≥ 26	≥ 29	≥ 27	≥ 30	≥ 32	≥ 32	
	862 - 1000 MHz		T	≥ 18	≥ 18	≥ 18	≥ 25	≥ 23	≥ 27	≥ 25	≥ 27	≥ 31	≥ 32	
Tap-to-tap isolation		dB	≥ 18											
Return loss		dB	≥ 15											
Hum modulation (6 A)		dB	≤ -70											
Outside dimensions		mm	90 x 90 x 60											
Packed weight		g	300											

[1] T → Terminal. *RMT102-4* is final tap-off.

CATV TAP-OFFS - 1000 MHz

4-PORT TAP-OFFS

Model			RMT104-	8	11	14	17	20	23	26	29	32	35
Ref.				2663	2664	2665	2666	2667	2668	2669	2670	2671	2672
Through loss NOMINAL (MAXIMUM)	5 - 50 MHz	dB	T[1]	3.2 (3.7)	1.5 (1.9)	0.9 (1.4)	0.7 (1.1)	0.5 (0.9)	0.5 (0.9)	0.5 (0.9)	0.5 (0.9)	0.5 (0.9)	
	50 - 600 MHz		T	4.1 (4.4)	2.0 (2.4)	1.2 (1.8)	0.8 (1.4)	0.7 (1.3)	0.6 (1.3)	0.5 (1.1)	0.5 (1.3)	0.5 (1.3)	
	600 - 862 MHz		T	4.2 (4.6)	2.3 (3.0)	1.6 (2.4)	1.0 (1.8)	1.0 (1.6)	0.8 (1.6)	0.8 (1.6)	0.8 (1.6)	0.7 (1.6)	
	862 - 1000 MHz		T	4.4 (4.9)	3.1 (3.7)	2.4 (3.1)	1.4 (2.2)	1.1 (1.8)	1.0 (1.8)	0.9 (1.8)	0.9 (1.8)	0.9 (1.8)	
Tap loss	5 - 50 MHz	dB		7.0 ± 1.0	10.3 ± 1.0	13.7 ± 1.0	17.7 ± 1.0	20.2 ± 1.0	23.1 ± 1.0	25.5 ± 1.0	28.6 ± 1.0	31.4 ± 1.0	34.5 ± 1.0
	50 - 600 MHz			6.9 ± 1.0	10.2 ± 1.0	14.2 ± 1.0	17.2 ± 1.0	20.3 ± 1.0	23.2 ± 1.0	25.8 ± 1.0	29.0 ± 1.0	31.6 ± 1.0	35.0 ± 1.0
	600 - 862 MHz			7.2 ± 1.7	10.4 ± 1.7	14.3 ± 1.7	16.4 ± 1.7	20.1 ± 1.7	22.7 ± 1.7	25.7 ± 1.7	28.8 ± 1.7	30.9 ± 2.1	34.5 ± 2.1
	862 - 1000 MHz			7.4 ± 2.0	10.8 ± 2.0	14.2 ± 2.0	15.7 ± 2.0	20.6 ± 2.0	23.5 ± 2.0	26.3 ± 2.0	28.4 ± 2.0	30.9 ± 2.6	35.0 ± 2.6
Taps-to-output isolation	5 - 50 MHz	dB	T[1]	≥ 18	≥ 20	≥ 26	≥ 35	≥ 35	≥ 38	≥ 40	≥ 42	≥ 45	
	50 - 600 MHz		T	≥ 22	≥ 20	≥ 20	≥ 33	≥ 32	≥ 30	≥ 39	≥ 41	≥ 43	
	600 - 862 MHz		T	≥ 20	≥ 19	≥ 19	≥ 30	≥ 28	≥ 26	≥ 30	≥ 32	≥ 32	
	862 - 1000 MHz		T	≥ 18	≥ 18	≥ 18	≥ 28	≥ 27	≥ 25	≥ 27	≥ 31	≥ 32	
Tap-to-tap isolation		dB		≥ 18									
Return loss		dB		≥ 15									
Hum modulation (6 A)		dB		≤ -70									
Outside dimensions		mm		90 x 90 x 60									
Packed weight		g		300									

[1] T → Terminal. *RMT104-8* is final tap-off..

8-PORT TAP-OFFS

Model			RMT108-	11	14	17	20	23	26	29	32	35
Ref.				2673	2674	2675	2676	2677	2678	2679	2680	2681
Through loss NOMINAL (MAXIMUM)	5 - 50 MHz	dB	T[1]	3.3 (3.7)	1.5 (1.9)	1.0 (1.4)	0.8 (1.2)	0.7 (1.1)	0.5 (0.9)	0.5 (0.9)	0.5 (0.9)	
	50 - 600 MHz		T	3.8 (4.4)	1.9 (2.5)	1.4 (1.9)	1.2 (1.7)	1.2 (1.3)	0.9 (1.3)	0.9 (1.3)	0.7 (1.3)	
	600 - 862 MHz		T	4.0 (4.7)	2.2 (3.1)	1.5 (2.3)	1.2 (1.9)	1.0 (1.6)	0.9 (1.6)	0.8 (1.6)	0.9 (1.6)	
	862 - 1000 MHz		T	4.2 (4.9)	2.5 (3.5)	2.1 (3.1)	1.3 (2.2)	1.1 (1.8)	1.0 (1.8)	0.8 (1.8)	0.9 (1.8)	
Tap loss	5 - 50 MHz	dB		10.3 ± 1.0	14.0 ± 1.0	17.1 ± 1.0	20.1 ± 1.0	23.2 ± 1.0	25.4 ± 1.0	28.5 ± 1.0	31.4 ± 1.0	35.0 ± 1.0
	50 - 600 MHz			10.3 ± 1.0	13.7 ± 1.0	17.6 ± 1.0	20.3 ± 1.0	23.5 ± 1.0	25.9 ± 1.0	29.5 ± 1.0	32.0 ± 1.0	35.6 ± 1.0
	600 - 862 MHz			10.7 ± 1.7	14.0 ± 1.7	17.5 ± 1.7	20.4 ± 1.7	23.4 ± 1.7	25.7 ± 1.7	29.0 ± 1.7	31.9 ± 2.1	35.9 ± 2.1	
	862 - 1000 MHz			11.5 ± 2.0	14.7 ± 2.0	17.9 ± 2.0	21.0 ± 2.0	23.3 ± 2.0	25.3 ± 2.0	28.3 ± 2.0	31.7 ± 2.6	35.9 ± 2.6	
Taps-to-output isolation	5 - 50 MHz	dB	T[1]	≥ 18	≥ 20	≥ 26	≥ 35	≥ 35	≥ 38	≥ 40	≥ 42		
	50 - 600 MHz		T	≥ 22	≥ 20	≥ 20	≥ 33	≥ 32	≥ 30	≥ 39	≥ 41		
	600 - 862 MHz		T	≥ 20	≥ 19	≥ 19	≥ 30	≥ 28	≥ 26	≥ 30	≥ 32		
	862 - 1000 MHz		T	≥ 18	≥ 18	≥ 18	≥ 28	≥ 27	≥ 25	≥ 27	≥ 31		
Tap-to-tap isolation		dB		≥ 18									
Return loss		dB		≥ 15									
Hum modulation (6 A)		dB		≤ -70									
Outside dimensions		mm		130 x 95 x 55									
Packed weight		g		500									

[1] T → Terminal *RMT108-11* is final tap-off

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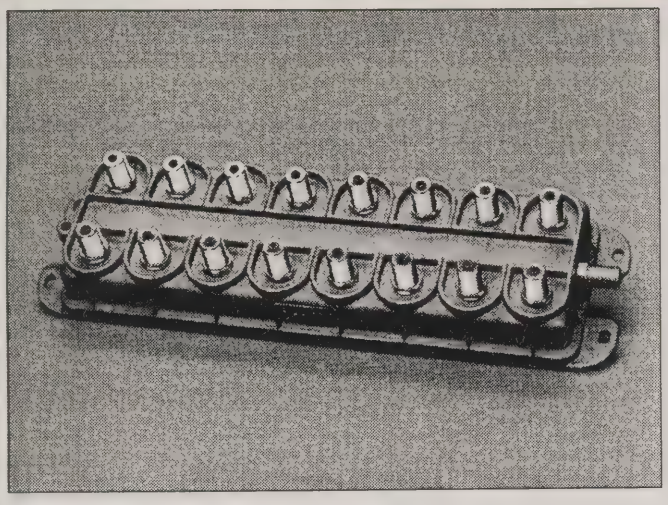
CATV 16-WAY SPLITTER - 1000 MHz



The **GS16DGV** splitter may be used where cascading several 2- and 3-way splitters to meet the demands of dense MDU (multiple dwelling units) is needed.

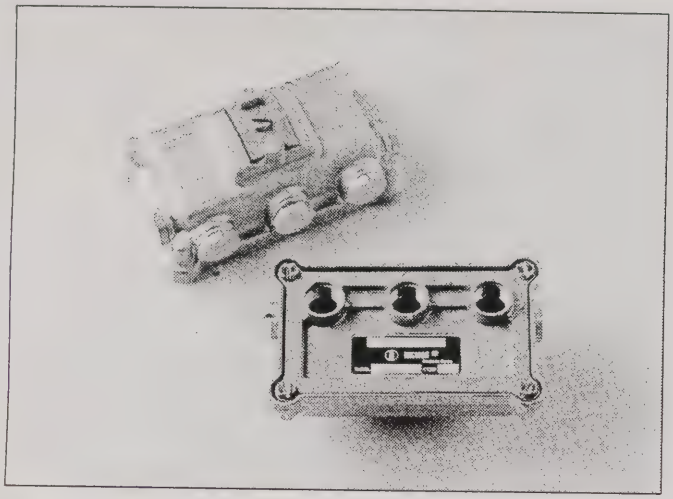
It is presented in a chromate treated zinc alloy housing to resist corrosion. Tongue and groove housing design provides exceptional RFI shielding (100 dB minimum) and an epoxy weather seal prevents water migration. Printed circuit board ensures consistent RF performance and high mechanical stability. All ports are machined "F" type.

Fitting and earthing of the housing are carried out through supplied screws.

16-WAY SPLITTER

Model			GS16DGV
Ref.			2651
Insertion loss	5 - 50 MHz	dB	≤ 15.5
	50 - 600 MHz		≤ 16.5
	600 - 862 MHz		≤ 17.5
	862 - 1000 MHz		≤ 18.5
Output isolation	5 - 50 MHz	dB	≥ 18
	50 - 600 MHz		≥ 20
	600 - 862 MHz		≥ 19
	862 - 1000 MHz		≥ 18
Return loss		dB	≥ 15
Outside dimensions		mm	550 x 65 x 40
Packed weight		g	550

CATV LINE PASSIVES - 862 MHz



A directional coupler and a two-way splitter are the IKUSI passive elements for trunk line in CATV systems up to 862 MHz. They are presented in a tough zinc alloy (UNE 1743) housing for outdoor mounting (wheatherproofing IP67 grade), provided with stainless steel metallic pieces for earthing and mounting –cable, wall or pole-mounting (angle-holder *Ref. 2974* required for the two last ones). All ports are 5/8"-24 type; two of these are dual ports for allowing frontal or side connection.

The current passing is general and selectable to each port. Its high capacity (10 A, 60 VAC) is especially useful to simplify the powering and maintenance of the cable network.

- Bandwidth: 10-862 MHz
- Impedance: 75 Ω
- Operating temperature range: -20 ... +70° C
- Outside dimensions: 125x75x55 mm
- Packed weight: 630 g

DIRECTIONAL COUPLER

Model			TDL-112
Ref.			2970
Through loss	10 - 50 MHz	dB	1.3 ±0.1
	50 - 500 MHz		1.0 ±0.1
	500 - 862 MHz		1.2 ±0.1
Tap loss	10 - 50 MHz	dB	13.6 ±0.5
	50 - 500 MHz		12.9 ±0.1
	500 - 862 MHz		12.9 ±0.1
Tap-to-output isolation		dB	> 30
Return loss		dB	> 14
Hum modulation (10 A)		dB	< -70

TWO-WAY LINE SPLITTER

Model			TDV-205
Ref.			2972
Insertion loss	10 - 50 MHz	dB	3.8 ±0.1
	50 - 500 MHz		3.9 ±0.2
	500 - 862 MHz		4.4 ±0.3
Output isolation		dB	> 22
Return loss		dB	> 14
Hum modulation (10 A)		dB	< -70

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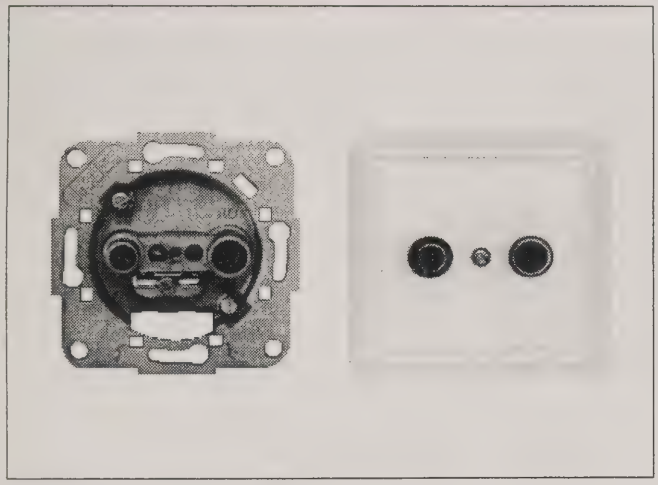
CATV SUBSCRIBER WALL SOCKETS



- Size and fixing according DIN 45330 (UNE 20-523-76) standard.
- Shielded zinc alloy diecast body.
- Printed circuit board featuring SMD components.
- Flush- or alternative surface-mounting using appropriate accessory. ABS plastic coverplate supplied, dimensions: 80 x 80 mm.
- Specific models for different network operating systems.
- CE Certificate.

OVERVIEW

The special care concerning the CATV installations, mainly those of two-way use, demands exceptional performance to the subscriber sockets. High screening factor, low return losses and good frequency response flatness are esential points to be considered that become especially critical when a full or partial digital operation is previewed.

IKUSI offers a wide range of CATV subscriber sockets which is not only intended for different frequency planning but also for fitting miscellaneous installation types. From the latter point of view, termination sockets (use in tap-off lines) and cascade sockets (for loop-wired installations) are considered. This last kind of installation becomes very popular when there is more than one TV set at home or simply when the subscriber wants to have comfortable access to TV and radio signals in different rooms; a combination of *room amplifiers* («TAE-100» series) and cascade type sockets is usually needed.

TERMINATION SOCKETS

Model		**ARTU-25**	**ARTU-35**
Ref.		**2733**	**2718**
Technology		**LC filters**	**LC filters**
Frequency range	**MHz**	TV 5 – 68 – 118 – 1000 RD 87.5 – 108	TV 120 – 862 RD 10 – 108
INPUT-TV through loss	**dB**	**<1** (5-68 MHz and 125-1000 MHz) „ **≤2.5** (118-125 MHz)	**≤0.5**
INPUT-RD through loss	**dB**	**≤3**	**≤3**
TV-RD isolation	**dB**	**≥10**	**≥10**
Impedance	**Ω**	**75**	**75**
Input return loss	**dB**	**≥18** (5-40 MHz) **≥18-1.5 dB/oct** (40-1000 MHz, exc. 87.5-108 MHz: **≥10**)	**>10**
TV output return loss	**dB**	**≥14** (5-40 MHz) „ **≥14-1.5 dB/oct** (40-1000 MHz), but **≥10**	**>10**
RD output return loss	**dB**	**>10**	
Screening factor	**dB**	**≥75** (f < 470 MHz) „ **≥65** (f ≥ 470 MHz)	
Connector type		TV ➞ **IEC 9.5 mm male** „ RD ➞ **IEC 9.5 mm female**	
Dimensions	**mm**	**80 x 80 x 40**	
Packed weight	**g**	**75**	

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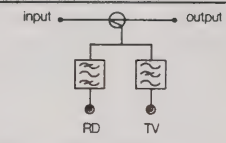
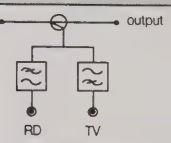
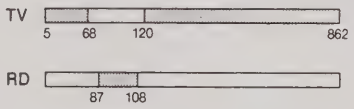
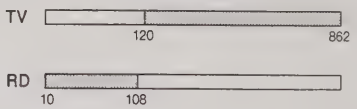
CATV SUBSCRIBER WALL SOCKETS

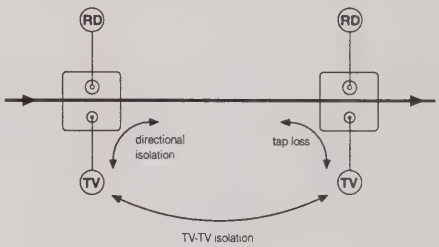
CASCADE SOCKETS

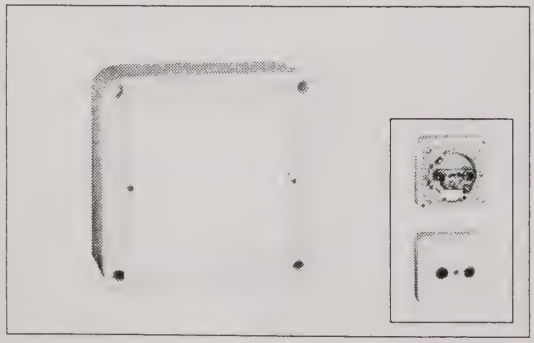
Model			ARTU-23	ARTU-24	ARTU-33	ARTU-34
Ref.			2731	2732	2716	2717
Technology			Directional coupler + LC filters			
Electrical diagram						
Frequency range		MHz				
Tap loss (f>30MHz)	input - TV	dB	11.5	7.5	11.5	7.5
	input - RD		14	10	14	10
Through loss (input - output)		dB	1	2.5	1	2.5
Directional isolation	output - TV	dB	>25	>20	>25	>20
	output - RD		>40	>36	>40	>36
TV - RD isolation		dB	>10	>10	>10	>10
Return signal feeding-in attenuation (f≤30MHz)		dB	15	10	14	9
Impedance		Ω	75			
Return loss at any connection		dB	>10			
Screening factor		dB	≥75 (f < 470 MHz) „ ≥65 (f ≥ 470 MHz)			
Connector type			TV → IEC 9.5 mm, male „ RD → IEC 9.5 mm, female			
Dimensions		mm	80 x 80 x 40			
Packed weight		g	75			

A cascade socket installed as last one in a line must be loaded by a 75Ω terminal resistor *Ref. 1520.*

ISOLATION BETWEEN TWO SOCKETS:
Isolation between two consecutive sockets, sometimes mentioned in Regulations, can be calculated from the tap loss and directional isolation values given in the table, adding the RF attenuation of the electrical path between the concerned sockets.

Figure shows graphically the isolation between two TV connections.





Surface mounting box	ABT-210 Ref. 1460

- Allows surface mounting of the sockets with no need of embedding the body in the wall. The body and the cover plate fit the outer part of the box, which can be fixed to the wall by means of screws supplied.
- Dimensions: 80 x 80 x 30 mm
- Packed weight: 40 g

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CATV CABLES & CONNECTORS

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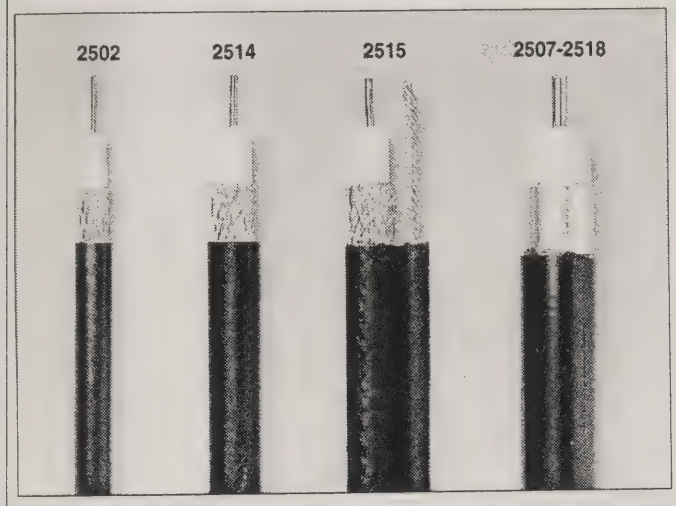
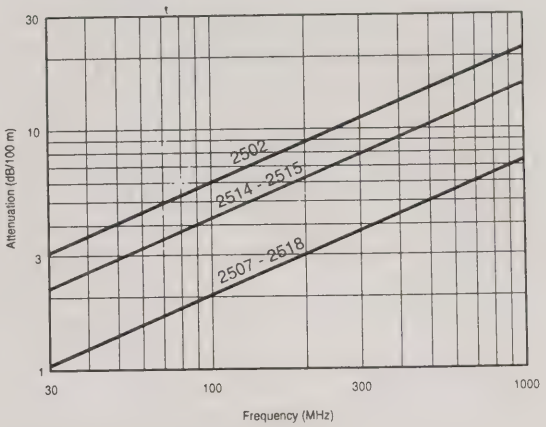
COAXIAL CABLES



Attenuation characteristics



TECHNICAL DATA

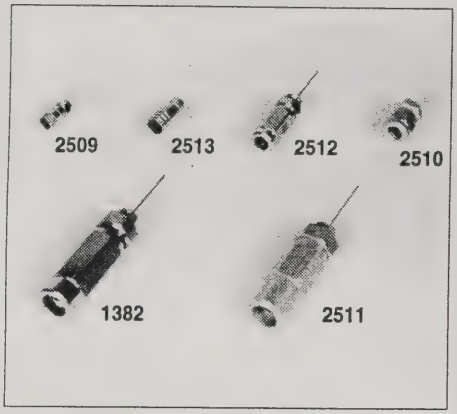
Model		CCT-170	CCT-125	CCT-126	CCT-650	CCT-540
Ref.		2502	2514	2515	2507	2518
Inner conductor - Diameter	mm	Cu 1.15	Cu 1.65		Copper clad aluminium 3.15	
Dielectric - Diameter	mm	Foam PE 4.9	Foam PE 7.1		Foam PE 13	
Outer conductor - Diameter	mm	Al(tape) + Cu/Sn(braid) 5.4	Al (tape + Cu/Sn (braid) 7.8		Al (tube) 13.7	
Outer sheath (black) - Diameter	mm	PE 7.4	PE 10.2		PE 15.4	
Characteristic impedance	Ω	75 ±3	75 ±3		75 ±2	
Maximum attenuation at 20° C (*)						
f = 100 MHz	dB/100m	6.2	4.6		2.1	
200		8.6	6.2		3.0	
500		13.8	10.1		4.9	
600		14.9	11.0		5.4	
750		17.1	12.3		6.1	
862		18.3	13.1		6.5	
DC resistance of: - inner conductor	Ω/100m	1.68	0.9		0.33	
- outer conductor		1.14	1.2		0.19	
Velocity ratio of propagation	%	77	77		88	
Nominal capacitance	pF/m	55	55		50	
Operating temperature	°C	-20 ... +50	-20 ... +50		-20 ... +50	
Minimum bending radius	cm	7	8	10	13	
Pulling tension	daN	40	60	170	100	
Weight	kg/100m	4.2	8.6	13.4	20	
Support strand - Diameter	mm	—	—	2.2	—	

(*) Attenuation coefficient: 2.10^{-3} / °C

NOTES:
- *CCT-170* model is supplied in 100 m cable reels.
- By way of information: *CCT-125* cable is RG-11 type; *CCT-650* and *CCT-540* cables are RG-245 type.

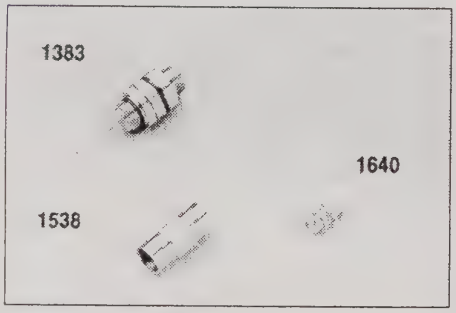
vers. 9512

CABLE CONNECTORS



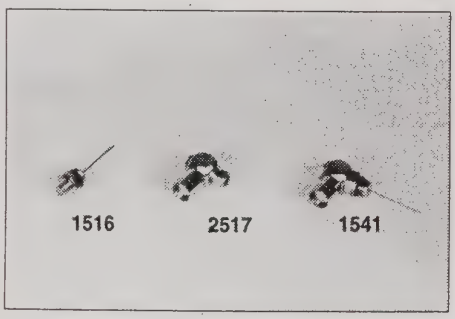
75Ω CONNECTORS

Model	Ref.	Type	Use cable	Material	Packed weight
CMF-170	2509	Crimp "F" male	CCT-170	Nickeled brass	10 g
CTF-125	2513	Crimp "F" male	CCT-125 CCT-126	Nickeled brass	20 g
CTP-125	2512	Pin 5/8"	CCT-125 CCT-126	Nickeled brass	75 g
CLP-125	2510	Feed-through 5/8"	CCT-125 CCT-126	Chromate coating aluminium	25 g
CMC-650	1382	Pin 5/8"	CCT-650 CCT-540	Nickeled brass	160 g
CLP-540	2511	Pin 5/8"	CCT-650 CCT-540	Chromate coating aluminium	75 g



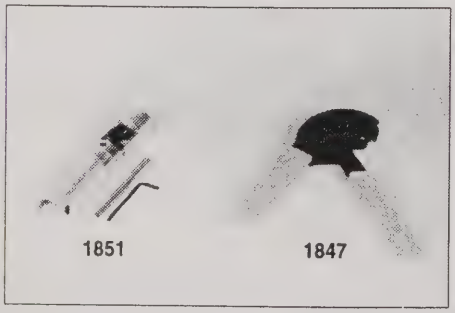
JOINING CONNECTORS

Model	Ref.	Type	Material	Packed weight
SAI-311	1640	"F" Double female	Nickeled brass	10 g
EHP-162	1538	5/8" Double female	Nickeled brass	20 g
CMM-580	1383	5/8" Double male	Nickeled brass	85 g



ADAPTERS

Model	Ref.	Type	Material	Packed weight
TCF-580	1516	"F" (F) - 5/8" (M)	Nickeled brass	30 g
TTF-090	2517	5/8" (F) - "F" (M)	Nickeled brass	80 g
CAP-162	1541	90° 5/8" (F–M)	Nickeled brass	100 g



TOOLS

Model	Ref.	Description	Packed weight
PLC-650	1851	Leave the *CCT-650* and *CCT-540* cables fully prepared to accept the pin 5/8" connectors.	425 g
UCF-170	1847	Hex crimp tool for *CMF-170* and *CTF-125* connectors.	700 g

"F" 75Ω load	CTF-075 Ref. 2221
• For75Ω loading an "F" port. Idem a 5/8" port through the adapter *Ref. 1516.* • Nickeled brass. Packed weight: 8 g	

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CATV POWER SUPPLIES

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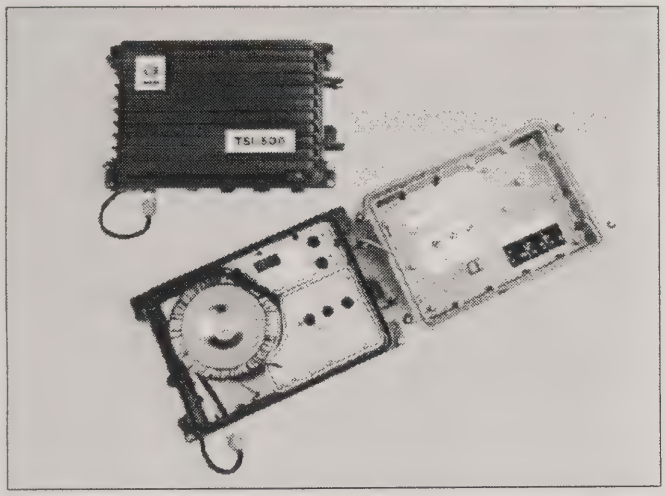
TSI-500. POWER SUPPLY / POWER INSERTER - 3 RF PORTS



The TSI-500 is a «power supply/power inserter» that may be RF configurated as ***single inserter***, ***2-way splitter*** or ***1-port tapoff***. From mains supply, it inserts a 60 V_{AC} voltage to any of the coaxial cables connected to the unit (two cables –span sections– when using as single inserter or three cables in the splitter or tapoff configurations).

The unit is presented in a tough aluminium (UNE L-2630/SAE-306) die-cast housing for outdoor mounting. A neoprene compression gasket and a neoprene/metal-mesh radiation gasket provide maximum RFI shielding and a wheatherproofing IP67 grade. RF ports are 5/8"-24 type.

- Three fuses/switches for AC insertion to one, two, or the three RF ports.
- Eliminating circuit of overcurrents at the mains switch-on.
- Input and output fuses with status led indicators.
- Output overvoltage VDR protection.
- Wall fixing, or pole/strand fixing through appropriate accessorie (see page 3H.1).
- Earthing and sealing facilities.

TECHNICAL DATA

Model			**TSI-500**
Ref.			**2179**
Bandwidth		MHz	5 – 862
Nominal mains supply		V_{AC}	220 / 240
Nominal inserted voltage (at max load)		V_{AC}	61
Impedance		Ω	75
Return loss		dB	>16
Max insertion loss	«single inserter» configuration	dB	0.6
	«splitter» configuration		(2x) 4.5
	«tapoff» configuration		1.6 and 12
Response flatness		dB	≤ ±0.5
Max current to one RF port		A	5
Max current to all RF ports		A	5
Hum modulation		dB	≤ -70
Efficiency		%	90
Load regulation		%	0 ... -6
Screening factor		dB	>80
Fuse/switch of AC injection			(3x) Semi-delay 6.3A / 250V
Fuse of transformer primary			T 3.15A / 250V
Fuse of transformer secondary			T 10A / 250V
AC requirements		VA	330
Operating temperature range		°C	-20 ... +70
Outside dimensions		mm	300 x 200 x 100
Packed weight		kg	5.980

MISCELLANEOUS

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RF POWER AMPLIFIER MODULE FOR TV MICROREPEATERS

The *EMP-420* is a high gain, 170-862 MHz linear amplifier module to be used as final stage of a TV microrepeater. It is presented in an identical format to that of the vertical modules from the IKUSI "TSP-5" series for CATV headends, making use of their particular fitting and connecting characteristics.

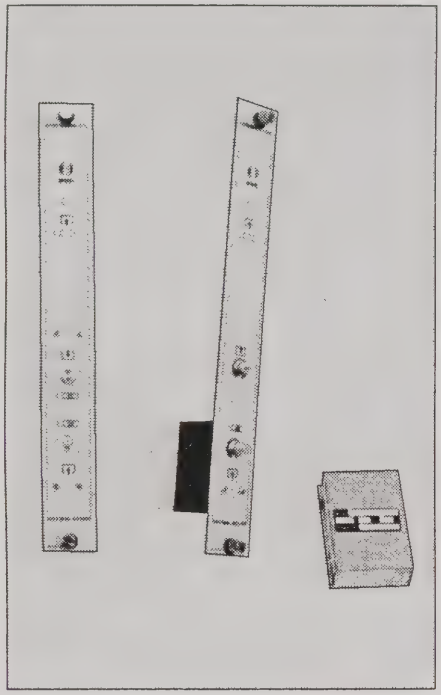
The module includes a switch mode power supply from the mains, which provides the powering voltage for the RF section of the own module as well as an auxiliary one (+12VDC/2A) to power the microrepeater input module (a channel processor or a «satellite receiver + modulator» assembly).

The RF output is normally connected to a channelised filter or, if a simultaneous system is concerned, to the corresponding input of a selective multiplexer. Both elements keep out the "TSP-5" modular format.

TECHNICAL DATA

Model		**EMP-420**
Ref.		**2168**
Frequency range	**MHz**	**170 - 862**
Output level (IMD= -54 dB IMD 45004K)	**W**	**2**
Gain adjustment	**dB**	**35 - 55**
Input nominal impedance	**Ω**	**75**
Output nominal impedance	**Ω**	**50**
Input SWR		**< 1.5**
Output SWR (with output filter)		**< 1.2**
Max SWR for survival		**No limit**
Mains voltage	**VAC**	**185 - 264**
Power supply type		**Switch-mode**
Spurious in band	**dB**	**< -60**
RF output level stability	**dB**	**± 1**
Available voltage output	**VDC**	**12** (2A)
Max total power consumption (with the input module)	**VA**	**15**
RF output connector type		**"F"** ("N" opt.)
General RF connectors' type		**"F"**
Operating temperature	**°C**	**-10 ... +55**
Dimensions (h x w x d)	**mm**	**360 x 40 x 230**
Weight	**kg**	**2.400**

PASSIVE ELEMENTS FOR TV MICROREPEATERS



CHANNEL FILTERS

For improving the spectral purity of the RF power amplifiers. They are used in single and simultaneous systems.

Model		EMF-430	EMF-440
Ref.		**2163**	**2164**
Frequency range	MHz	170 - 230	470 - 862
Nominal impedance	Ω	50	
SWR		<1.2	
Insertion loss	dB	<1.5	
Connector type		"F"	
Mounting panel		**Not included** (See accessory Ref. 2167 below)	

MULTIPLEXERS

For use in simultaneous systems (up to 5 channels). "EMF-400" channel filters required.

Model		EMM-403	EMM-405
Ref.		**2160**	**2161**
Number of input TV channels [1]		2 - 3	4 - 5
Frecuency range	MHz	170 - 230	470 - 862
Nominal impedance	Ω	50	
SWR		<1.5	
Through loss	dB	0,8	1.5
Connector type		"F"	
Channel filters		**Not included** (see above)	
Mounting panel		**Included**	

[1] Minimum gap: 2 TV channels.

ACCESSORIES

Model	EMF-400	EMC-400	CN-12M
Ref.	**2167**	**2162**	**1118**
Description	**Front panel for the channel filter units**	**"N" connector kit**	**N" connector for RG-213 cable**
Use	To fit a filter in a single system	"N" type connector at the microrepeater output	"N" connection

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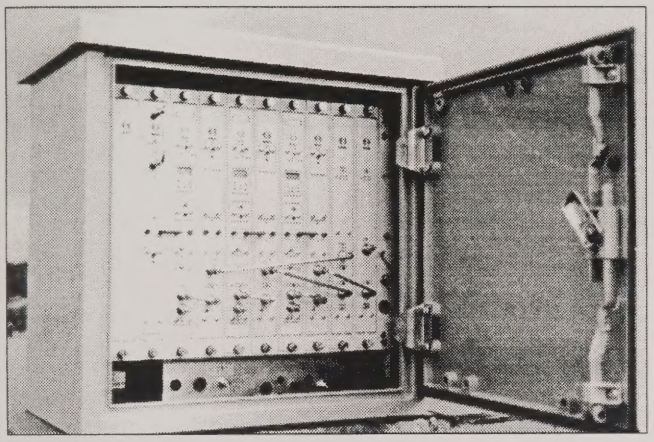
OUTDOOR MOUNTING CABINETS - TV MICROREPEATERS

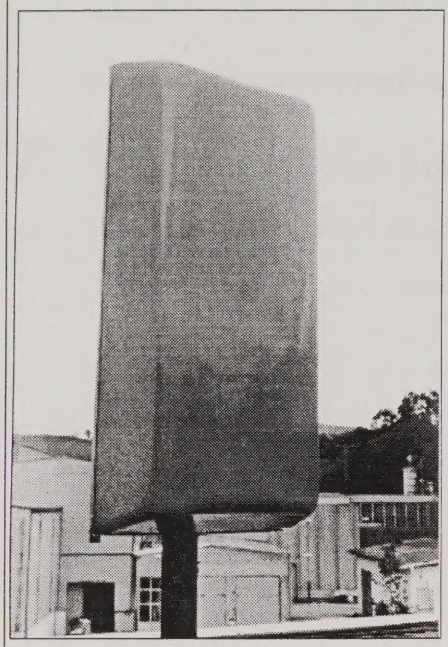


- Material: Polyester fiber.
- 19" internal rack frame for direct mounting of the microrepeater modules.
- Built-in power supply for mast-head preamplifiers.
- Weatherproofing IP-599 grade if forced draught is not needed.
- Padlock and sealing facilities.

TECHNICAL DATA

Model		RAE-408	RAE-416
Ref.		2170	2173
High-unit capacity	u	8	16
Max number of simultaneous channels		3	5
Rack-frame for module mounting		Included	
Fan with thermostate		Included	
Available voltage for mast-head amplifiers	Vdc	+24 (100mA)	
Dimensions (h x w x d)	mm	500 x 500 x 300	1000 x 500 x 300
Weight	kg	10	17

UHF BROADCASTING ANTENNA - TV MICROREPEATERS

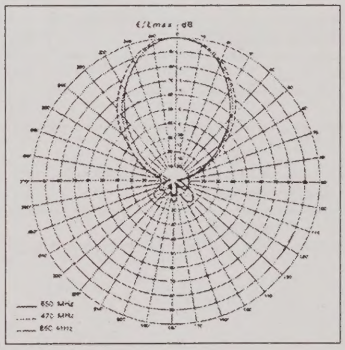


- UHF panel antenna for TV repeaters up to 1kW RF power.
- Brass dipoles with silver plated internal connections. Stainless steel reflector.
- Radomme of fiberglass reinforced polyester.

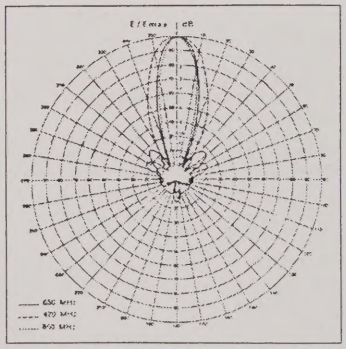
TECHNICAL DATA

Model			PAE-114
Ref.			2176
Electrical data	Frequency range	MHz	470 - 862
	Polarization		Horizontal
	Number of dipoles		4
	Impedance	Ω	50
	SWR		< 1.15
	Gain	dB	13
	Max RF power	W	1000
	Beamwidth	°	H: 60 - 70 „ V: 20 - 35 (see patterns)
	Connector type		"N" female
Mechanical data	Max wind speed	km / h	200
	Frontal wind load	N	740
	Lateral wind load	N	370
	Dimensions	mm	975 x 477 x 195
	Weight	kg	14.5

Horizontal radiation pattern



Vertical radiation pattern



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